ENGINEERING NEWS-RECORD

JULY 24, 1958

PRICE 50 CENTS

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How this 40-year-old dam got a "facial" p. 44

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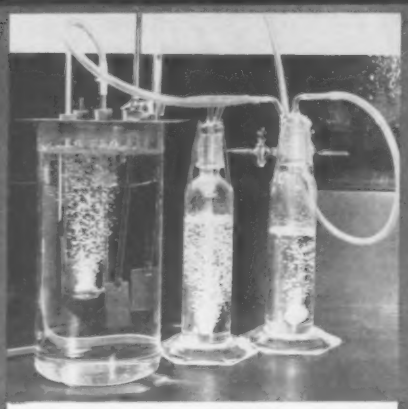
LANSING MICH 13

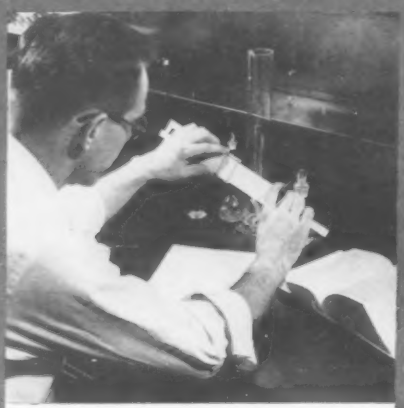
1 Analytical weighing of specimens prior to testing



2 Steam condensate corrosion test

3 Cleaning specimens with inhibited hydrochloric acid

4 Second analytical weighing to determine corrosion weight loss



5 Calculation and statistical analysis of laboratory test results

6 Final examination of specimens under low power magnification

Extensive testing program proves new 4-D Wrought Iron more corrosion-resistant than ferrous substitutes

Test results from the Byers Research Laboratory lend documentary support to the superiority of new 4-D Wrought Iron—over standard Wrought Iron as well as ferrous substitutes.

Convincing case-history service records are now further substantiated by the conclusive findings of our metallurgical staff. Some typical results of this testing program are presented in the chart at right.

The Byers field service representative will be pleased to relate these test results to your corrosive applications. Write us for helpful literature on new 4-D Wrought Iron. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

BYERS WROUGHT IRON

Comparative Analysis of 4-D Wrought Iron Corrosion Tests

Tests	4-D Wrought Iron	Standard Wrought Iron	Ferrous Substitutes
Severe industrial atmospheric continued exposure 17 years	Corrosion weight loss 540 grams/sq. ft.	Corrosion weight loss 655 grams/sq. ft.	Not included in test
Steam condensate return line	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 10 years (still in service)	Complete failure after 2 years
Aerated salt water—5 weeks (Short term test—points indicate 4-D Wrought Iron curve flattening out at much lower rate of attack)	Corrosion weight loss 146 mg/sq. in.	Corrosion weight loss 170 mg/sq. in.	Corrosion wt. loss 226 mg/sq. in.
Brine piping	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 23 years (still in service)	Complete failure after 7 years
Salt water, Gulf of Mexico ¼ inch plate—17 years	Corrosion weight loss 4 mills/years (minimum plate thickness now $\frac{3}{16}$") Still in excellent condition	Not included in test	Corrosion weight loss 30 mills/years; plate badly pitted, perforated
Downspout	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures in 29 years (Still in service)	Complete failure after 18 years

*In this application no long term test data yet available on 4-D Wrought Iron. Results shown are derived from short term tests.

GOODYEAR INDUSTRIAL PRODUCTS

GT-Specified

Contractor's Air-Water Hose for Construction Work

- **A** Rugged cover that's both abrasion- and sun-resisting—continuously print-branded for easy identification
- **B** Extra-tough braids of high-tensile rayon cord to handle pressures, resist crushing or kinking
- **C** Special nonporous tube resists alkali or slightly acid water

Now—a hose that's built for builders

Say good-by to the big inventories of both air hose and water hose most big construction jobs always required. Here, in a new kind of hose that handles the jobs of either one – you have the means of wiping out time-eating handling as well as profit-eating costs.

Goodyear and the G.T.M. – Goodyear Technical Man – developed and built this hose just for contractors. As an air hose, it accommodates pressures up to 200 psi. Or, as a water hose, it's ideal for filling, supply and wash-down service. And it's available in continuous lengths up to 500 feet (in the ½-inch size).

What's more, it gives you the super-toughness any contractor's hose must have. Muscular, high-tensile rayon cord reinforcements handle the high pressures and resist kinking or crushing – yet give you exceptional flexibility for easy handling. And an extra-tough cover resists abrasion, weathering, or any other kind of punishment construction work usually dishes out.

Wouldn't it pay *you* to look into this great new hose? It's one of more than 800 Goodyear hoses designed for every hose job. And they're all available through your Goodyear Distributor—or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

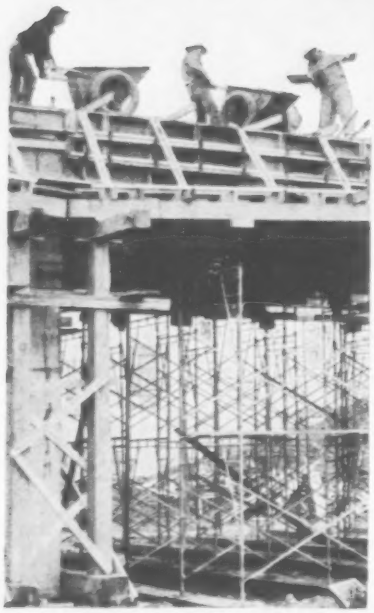
IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

CONTRACTOR'S AIR-WATER HOSE by

GOODYEAR 60th GOOD-YEAR ANNIVERSARY

THE GREATEST NAME IN RUBBER

Bridge Forming



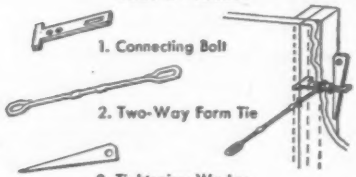
Symons Forms Cut 100 Days Off Bridge Forming Job

Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only ⅔ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES



3,144 square feet of panels were required for the 160,000 square feet of forming.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Avenue, Dept. G-8

Chicago 39, Illinois

ENGINEERING NEWS-RECORD

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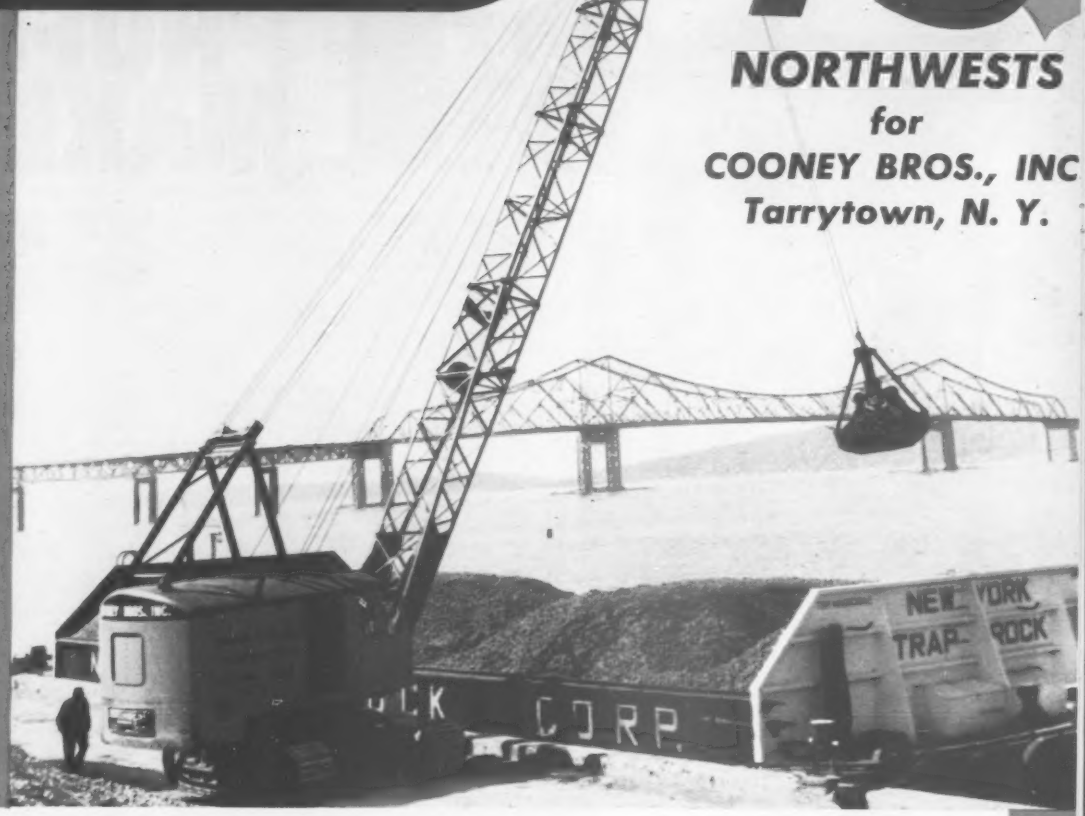
PROBLEM . . . Unloading Barges

13 NORTHWESTS for COONEY BROS., INC Tarrytown, N. Y.



NUMBER 13 for Cooney Bros., Inc., of Tarrytown, N. Y. and when you get to thirteen with twelve repeat orders you can be sure that the quality of performance isn't a matter of luck—and if it were luck you can bet it's all to the good. This Northwest 80-D makes fast work of unloading barges in the shadow of the great Tappan Zee Bridge near Tarrytown. In addition, it keeps the bin full from the stock piles at the sand and gravel plant of Cooney Bros.

Like all Northwests, these big 80-D's are smooth in operation. They are always ready to go. *We hear it everywhere and Northwest users will tell you so.*

The Northwest Feather-Touch Clutch Control brings power operation to the main drum clutches and at the same time preserves the *feel of the load* for the operator. Northwest Swing Clutches are Uniform Pressure Swing Clutches that give even pressure over the entire area of the clutch. This means smooth swing and perfect control of the machine and load. Smoother boom handling is augmented by the wide selection of Northwest boom hoist equipment—the standard Worm Boom Hoist, the Northwest High-Speed Boom Hoist, (independent of all other operations with power controlled lowering). The third drum that permits 3 load lines with either of the above boom hoists—Here you can get just the right equipment for handling any combination of problems.

These are just a few of the things that make the Northwest a better crane. A Northwest Man will be glad to give you the rest of the story.

NORTHWEST ENGINEERING COMPANY
1502 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST *Always Ready to GO*

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¼ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	⅜ Yd. to 3 Yd. Capacity	⅜ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

In the ½ to 3-yd . . . 8 to 75-ton range, Link-Belt Speeder offers the most complete line of crawler and rubber-tired shovel-cranes . . .

31 PROFIT MAKERS

4 Exceptionally Maneuverable Self-Propelled Models

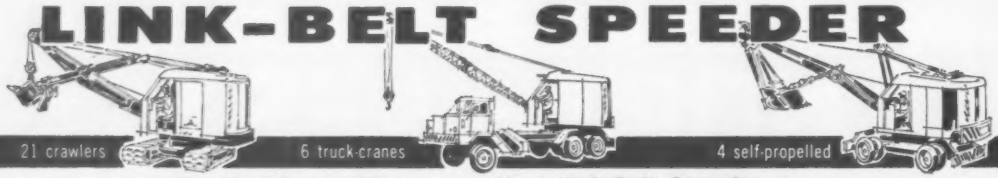
6 Big Capacity Truck-Cranes, all offer optional remote control.

21 **FAST AND RUGGED CRAWLER MODELS,** ranging from ½ to 3-yd, 8 to 75-ton capacities, are fully convertible to any standard front-end attachment. All feature Speed-o-Matic power hydraulic controls and hydraulic power steer as standard equipment.

Here's an opportunity to get exactly the machine you need and at the same time capitalize on scores of advance-design customer benefits such as exclusive Speed-o-Matic power hydraulic controls, bonus usable horsepower. Also, you get more standard features, a wider choice of optional features to tailor the machine for extra profits on any job.

For complete details, see your distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,923

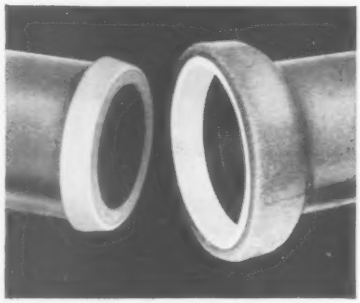
LINK-BELT SPEEDER



It's time to compare . . . with a Link-Belt Speeder

longer, stronger AMVIT Jointed Clay Pipe reduces maintenance FIVE WAYS

Factory-Made Mechanical Joint installed in over 100,000 miles of underground sewer systems



Slipshod, careless, and inferior construction methods only result in continuous maintenance, expense, and repair.

This is especially true in the construction of sanitary sewers.

Amvit* Jointed Clay Pipe was designed to eliminate the human error that often occurred when old-fashioned jointing methods were used. Tight joints are a *must*, and can only be obtained by using the best materials and workmanship. Here's why over 100,000 miles of Amvit are now in use across the nation:—

1. PREVENTS ROOT PENETRATION

Roots may force the pipe out of line and clog the system. Amvit is a compression joint on the ball and socket principle. The surfaces of both bell and spigot are in constant compression. And, since it is a bottletight joint, roots *cannot* enter the line.

2. RESISTS CHEMICAL ATTACK

Acid laden, high temperature sewage discharged from dishwashers, garbage disposal units, and washing machines will soften, warp, and blister substitute non-clay pipe. Like clay pipe, itself, Amvit Joint is not harmed by most acids, and will not corrode, decompose, or rot.

3. RESISTS ACID ATTACK

Grease and scum tend to build up inside the pipe. The resulting acid formation attacks and destroys certain synthetic substitute non-clay pipes. The design of the Amvit Joint assures that the pipe is self-centered at all times. This gives perfect alignment and self-cleansing action.

4. ELIMINATES EROSION AND DECOMPOSITION

Sand, gravel, and stones act as an abrasive and will scratch and roughen soft non-clay pipe. Because Amvit is a really tight joint, no foreign matter can possibly enter the line. And, like the pipe, Amvit Joint is unaffected by ordinary conditions of underground service.

5. COMPLETE FITTINGS

Amvit is furnished on all standard fittings as well as pipe 4″ through 24″ in diameter. This permits a uniformly tight line from house to treatment plant.

*T. M. Registered

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you, for this complete folder.

SINCE 1848

AMERICAN

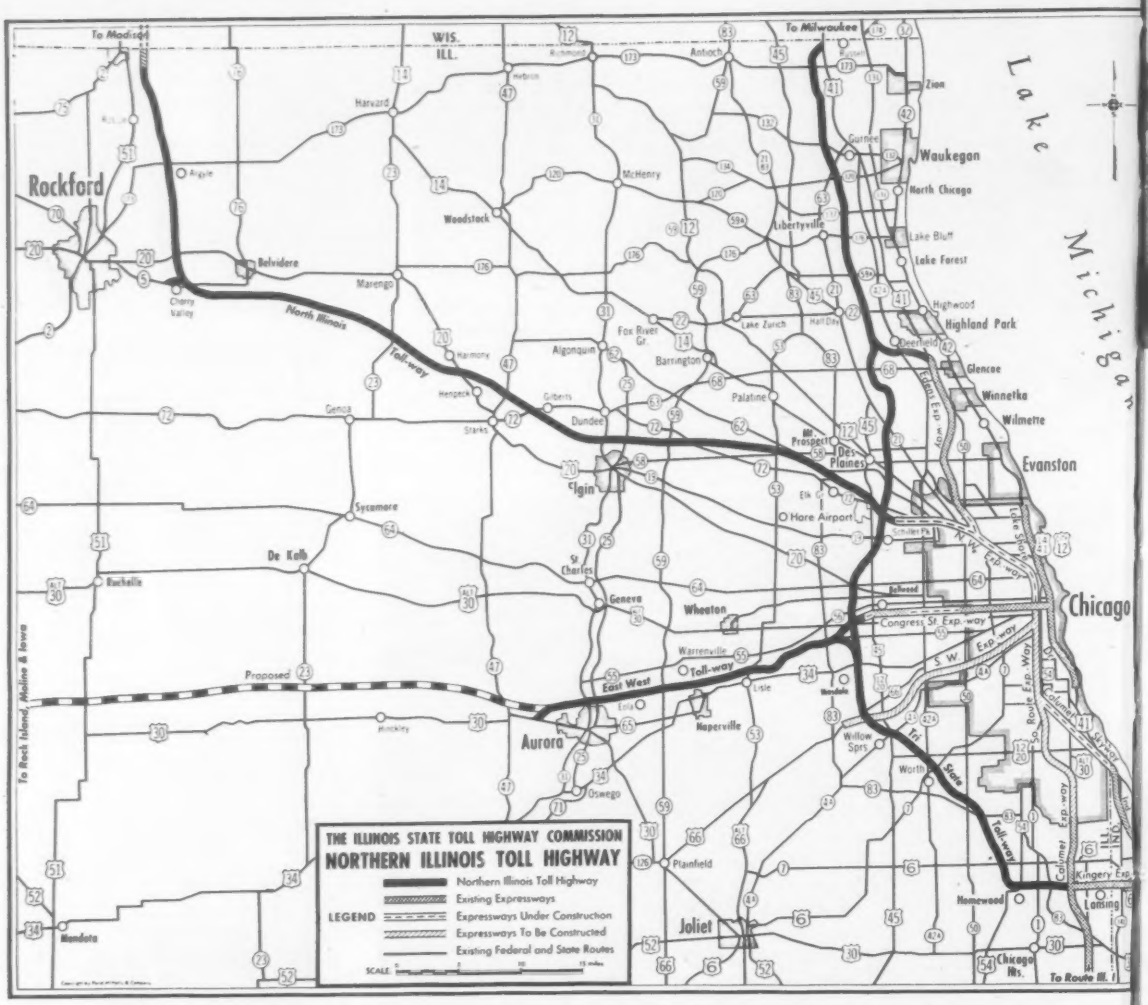
American Vitrified Products Company

CLEVELAND, OHIO

PLANTS ACROSS THE NATION . . . Brazil, Indiana • Chicago, Illinois • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Fenton, Michigan • Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, California • Milwaukee, Wisconsin • South Bend, Indiana • St. Louis, Missouri • Whitehall, Illinois

On The Northern Illinois Toll Highway

Prestressing Saved Millions



The Northern Illinois Toll Highway is the largest addition to America's rapidly expanding highway system. Approximately 200 miles of interconnected construction will link the Indiana Toll Road with a bypass of Chicago, and give quick access to Milwaukee and Madison, Wisconsin, and Aurora, Illinois.

Fox River Bridge—This bridge, near Elgin, Illinois, stretches 1381'7" across the Fox River. It contains 150 concrete beams, prestressed with USS American Super-Tens Stress-Relieved Strand. These huge beams are 92' long, 2' wide, and 5' deep. These are the people who built this bridge:

Designers and Engineers: Alfred Benesch & Associates, Chicago.

Consulting Engineer: Joseph K. Knoerle & Associates, Chicago and Baltimore.

Construction Contractors: Arcole Midwest Corp., Evanston, Illinois.

Prestréssed Concrete Supplier: Materials Service Corp., Algonquin, Illinois.

These are the other Prestressed Concrete Suppliers: Lewistown Midwest Division, American-Marietta Company, La Grange, Illinois.

Midwest Prestressed Concrete Company, Rochelle, Illinois.

Consumers Company, Hodgkins, Illinois.

18,000,000 feet of prestressing steel in 224 bridges is USS American Super-Tens Stress-Relieved Strand

THE USE OF PRESTRESSED CONCRETE MEMBERS for bridge construction has saved millions of dollars in building the Northern Illinois Toll Highway (Seventh Quarterly Progress Report of The Illinois State Toll Highway Commission). 224 new bridges along this new super-road will include a total of 18,000,000 feet of USS American Super-Tens Stress-Relieved Strand.

Beams and slabs for these bridges were prefabricated at prestressing plants, then shipped to the job sites for immediate installation. None of these bridges will ever need painting or maintenance because they are made of prestressed concrete. Prestressing wire and strand exerts a permanent compressing force . . . insures durable, crack-resistant, maintenace-free concrete construction members. In addition, guaranteed delivery means you receive prestressed concrete just as it is needed for construction.

Prestressed concrete has already been applied to all types of building construction as well as to bridges. Its future possibilities are almost unlimited.

For engineering assistance, or for more information on a complete line of prestressing wire and strand, call America's pioneer in the development of strand for prestressed concrete: American Steel & Wire. Or write to American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

USS, American and Super-Tens are trademarks

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
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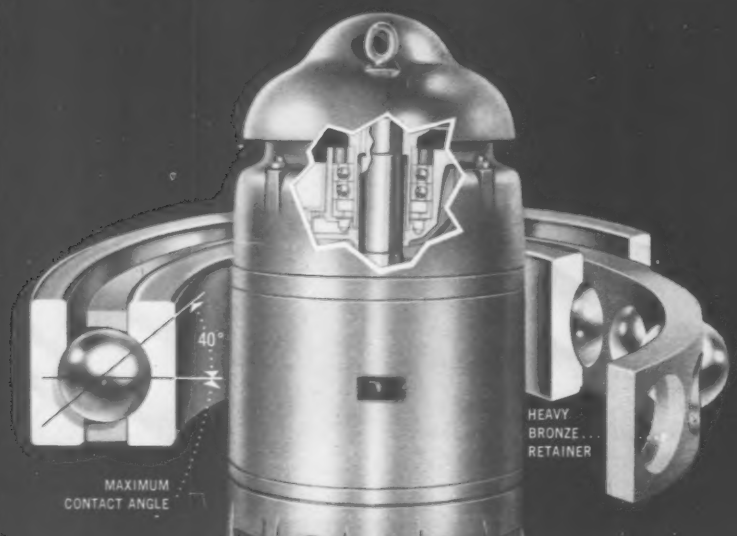
getting the MOST out of the thrust bearing in U.S. VERTICLOSED motors

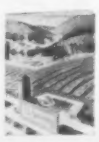


U.S. VERTICLOSED MOTORS are *built around* the thrust bearing that carries all the weight of water, shaft, and pump. The U.S. formula can't be excelled: First, start with the right type of bearing having a high contact angle and bronze retainer; second, provide a large oil reservoir with a *Visolube* window to let you *see* lubricant level; third, sleeve-mount the bearing for easy removal and inspection; fourth, design ventilation so that cool air constantly flows over the bearing; and fifth, balance the motor parts before and after assembly for smoothest operation. Thus U.S. VERTICLOSED Pump Motors are made to *give you the most* performance and dependability. Available in RATINGS 1½ TO 500 H.P. In any pump installation, be sure to specify: "U.S. VERTICLOSED MOTORS."

U.S. ELECTRICAL MOTORS INC.

P. O. BOX 2058, LOS ANGELES 54, CALIFORNIA
OR MILFORD, CONNECTICUT

FREE COLOR BROCHURE
...for full information, send for FREE illustrated Verticlosed Bulletin.



Reader Comment

Do We Need More Roads?

Economist Robinson Newcomb's recent article said we do. Here's what some ENR readers say about his views . . .

Let's Tell it to Congress

SIR—Robinson Newcomb has done a highly competent job of documenting the need for pushing road construction at a considerably higher rate than is presently contemplated by Congress (ENR June 19, p. 38).

Most of us in the industry have agreed right along with his major premise that roads need to be built faster than they are being built or than it is contemplated to build them. However, so far as I know, this is the only instance in which the reasons for the acceleration of the program have been set forth and clearly stated. This article should be brought to the attention of all of the people in Congress who have anything to do with roads.

J. R. STEELMAN, *President*
Koering Company
Milwaukee, Wis.

▶ It certainly is a provocative article, and we realize the challenge that it presents.

Mr. Newcomb takes a very realistic approach to the entire problem on the long-range basis, and that is what we must all consider if our highway construction rate is to provide the necessary capacity as the traffic increases.

HAROLD L. PLUMMER, *Chairman*
Highway Commission
State of Wisconsin

▶ His approach to the subject is unusual and interesting. Publication of his article will provoke some discussion and some further thinking along the same line. It should turn out to be worth while.

P. H. BIRCKHEAD, *Vice President*
Bucyrus-Erie Company
South Milwaukee, Wis.

Not In the Cards

▶ He makes a very good case for a still larger highway program, but I doubt if it is in the political cards to raise our sights again, at least within the next few years.

There is no doubt that not only the growth of the economy but the increasing adequacy of the highways will increase their use (and thereby keep them inadequate).

(Reader Comment continued page 12)

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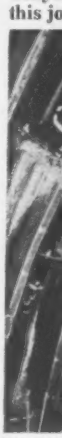

PLAIN
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Tunneling progress hiked by 24%

"EASY INSTALLATION of COMMERCIAL liner plates has enabled us to speed up our tunneling operations and has reduced to 33 days what had been proceeding at a 41-day rate", stated Mr. Ford G. Dyer, General Superintendent, Traylor Brothers, Inc., Evansville, Indiana. He adds, "Total labor savings on this job will be almost $17,000 because of our adoption of COMMERCIAL plates."

PLAINLY MARKED plates for 45", 132" and combination 45/132" radii tell miners just where each plate goes. Their curvature matches design lines of the semi-elliptical tunnel.

"ACCELERATED TUNNELING to a point where it now runs at the desired daily rate when we adopted the use of the lighter, easier to handle and couple COMMERCIAL plates."

"ENCOUNTERED NO PROBLEM with the COMMERCIAL liner plates. As excavation is made by our miners we simply join the COMMERCIAL liner with previous circle by inserting a spud wrench through the bolt openings of a liner already in place and the one about to be placed. Once the spud is through the openings we insert bolts and secure."

Time table on 500-ft. headings for Ohio River Interceptor Sewer cut from 41 to 33 days after switch to COMMERCIAL liner plates

This tunnel will be completed quicker and Traylor Brothers, Inc., the contractor, will save more than $4,000 on each of four 500-ft. headings—because of a change in the kind of liner plates installed for the Louisville & Jefferson County Sewer District.

A comparison test by Traylor Brothers of COMMERCIAL and a competitive liner plate was planned—two headings in the 8-ft. x 8-ft. semi-elliptical tunnel to use one type plate throughout, the remaining two headings the other. But, the advantages of COMMERCIAL's plates were soon so apparent that the switch was made to them for the balance of the plates required for the entire contract.

Eliminating difficulties encountered with the competitive type of plates, the more efficient pan-shaped COMMERCIAL plates were installed a quarter again as fast. Because all flanges of the COMMERCIAL plates are inside, placement and bolting together is quick and simple—complete erection is done inside the lining.

Muck yardage mined is reduced when continuous flange solid corner plates are installed because of their shallow corrugations and absence of external bolts that require hand positioning outside the lining. Less overmining is required—voids are smaller—grouting costs come down—loading on the entire lining is more uniformly distributed.

Engineering assistance for most efficient steel tunnel support regardless of size, shape or length in hard or soft ground is available from COMMERCIAL's engineers. To benefit from their 35-years experience, just write Commercial Shearing & Stamping Company, Dept. E-29, Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping

COSTS LESS TO BUY

A single, molded rubber gasket is the only accessory required. There are no bolts, no nuts, no followers, no couplings, no extras.

COSTS LESS TO INSTALL

Assembly is easy and rapid. Rate of installation usually is limited only by the speed of excavating the trench.

JOINT IS TIGHT

Bell-Tite forms a pressure-tight joint instantly. Restrained joint bursting tests prove joint stronger than the pipe itself.

This is it...

CLOW Bell-Tite® Joint Cast Iron Pipe

ALL-WEATHER JOINT

You keep your schedules with Bell-Tite Joint cast iron pipe. It can be easily laid in a wet trench or even under water.

UNDERWRITERS' LISTED

All diameters through 24″ listed and inspected by Underwriters' Laboratories, Inc. for working pressures to 350 psi.

AMPLE DEFLECTION

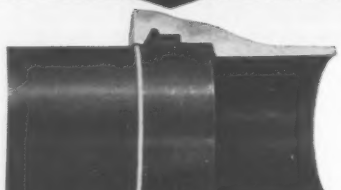
Bell-Tite Joint cast iron pipe is so designed that it will easily accommodate casual curves and normal grades.

MEETS ALL REQUIREMENTS

CLOW Bell-Tite Joint pipe is strong, tough, uniform and durable cast iron pipe for long-life underground service.

ANY SIZE OR THICKNESS

Available in any specified thickness or weight class in accordance with ASA, AWWA or Federal specifications. 3″ to 24″.



CLOW Bell-Tite Joint is easily assembled—Just wipe clean, lubricate and push spigot into the bell. When painted yellow stripe is no longer visible, joint is bottle tight.

ENTHUSIASTIC RECEPTION

Contractors and Municipalities—men who know pipe—have installed well over 1,000,000 feet of CLOW Bell-Tite pipe.

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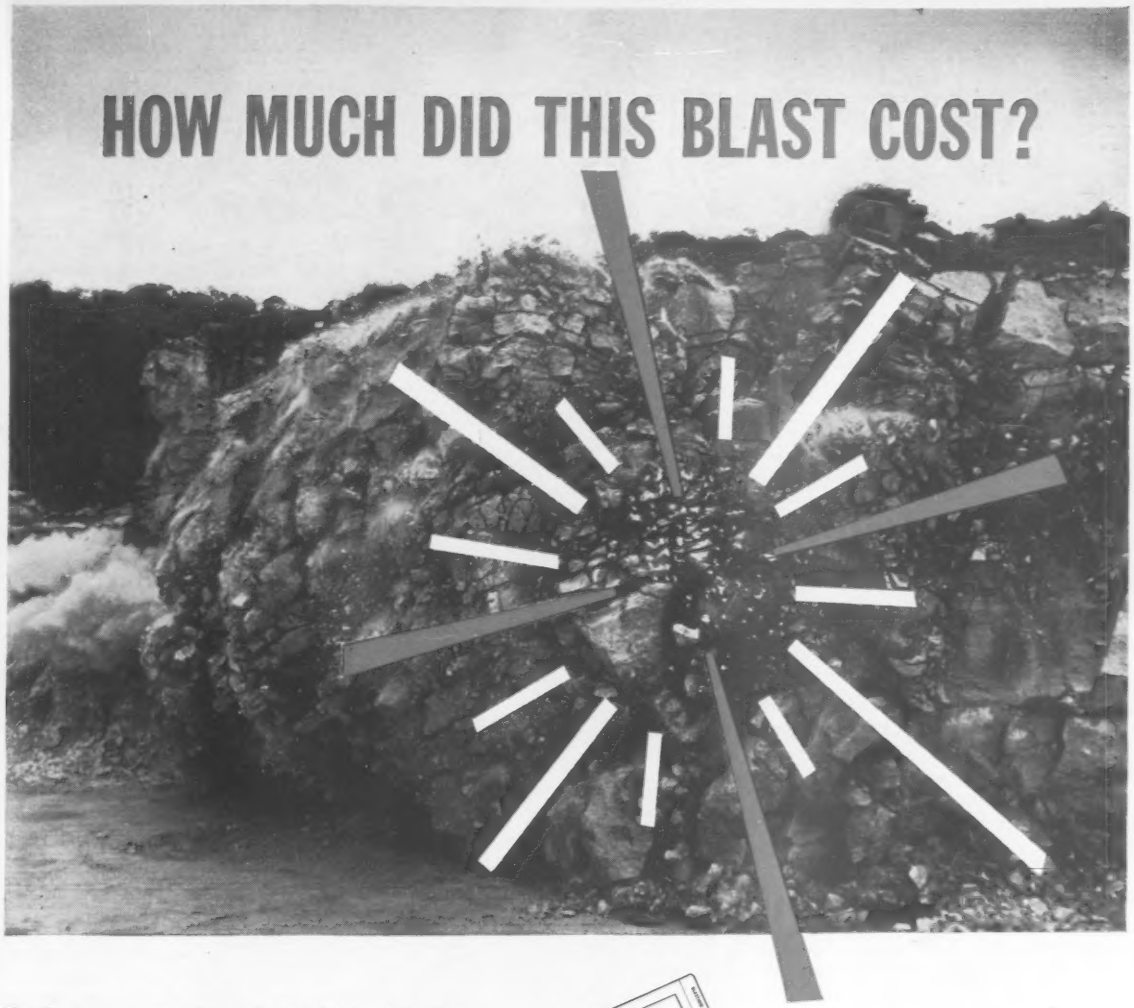

Explosives costs alone don't determine the value of a given blast. The explosives you use have a direct effect on the whole operation: drilling, digging, hauling and crushing.

You can find out, quickly and easily, the true, complete cost on any blast by using the new, simplified computing method developed by Atlas. It's called the Blasting Cost Chart, and it's yours without cost or obligation.

Use this new method to learn your real blasting costs. It will help you plug profit leaks and come out money ahead in your blasting. Your nearest Atlas representative will show you how the chart works, and you can keep the actual figures within your own organization.

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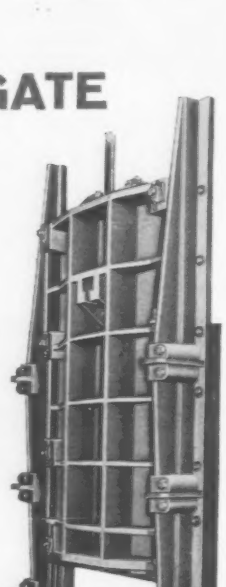

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. . . Reader Comment

Truckers are not carrying their share of the burden. Because of trucks, our highways have had to be built wider and heavier with lighter grades and with greater clearances. These extra costs are not assessed against trucks.

Furthermore, this subsidy is encouraging more trucks to use our highways, and our railways, owning, maintaining and paying taxes on their own right-of-way, are handicapped in competition and are not able to give us the full benefit of their essentially lower operating costs.

William B. Greene, *Chairman*
Barber-Greene Company
Aurora, Ill.

Some Disagreement

▶ I have read the article with considerable interest but can not agree with all of the conclusions.

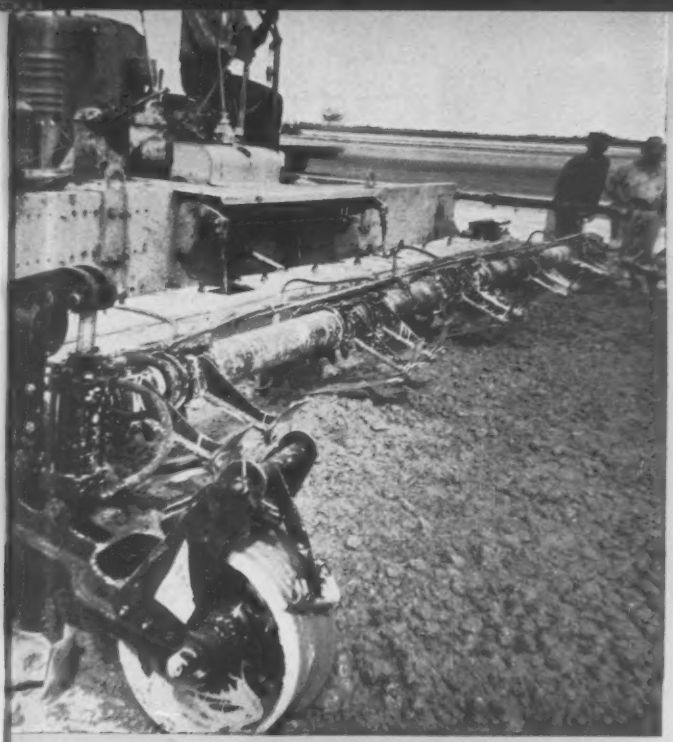
To begin with, the author fails to emphasize throughout his article that he is talking about highway construction funds only. He uses the term "highway expenditures" when obviously he means highway "construction" expenditures, which is an entirely different thing.

Furthermore, the author makes a mistake in tying only construction costs to our gross national product. Many seem not to realize that ¼ or more of our total highway expenditures annually goes into maintenance of these facilities. On hundreds of thousands of miles of town and county roads, as well as city streets, maintenance is the only work done. Thus, for these roads the total budget is primarily for maintenance.

• **Not enough maintenance**—It is my personal opinion that one of the major faults of highway administration in general is the failure to promptly and adequately maintain the highways we already have. If this were properly done, reconstruction and new construction would be considerably delayed on existing paved roads because of the resulting extension of their economical life.

Another misconception—the billions we are spending each year on construction does not presuppose that we are getting a substantial mileage of entirely

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



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Supplied with exceedingly powerful motors, there is no job of concrete HIGHWAY OR AIRPORT paving too tough for a JACKSON VIBRATORY PAVING TUBE. They are exceedingly flexible. Both internal and surface types may be had in just the right number of units to fit the job. And since the internal and surface vibratory units are interchangeable with optional equipment, the contractor who owns a JACKSON PAVING TUBE can quickly change from one to the other. Their use assures:

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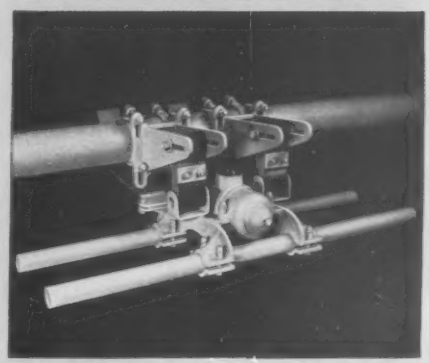
5. **Excellent finish without excessive mortar.**

See them at your Jackson Distributor Name and literature on request

INTERNAL TYPE

as shown in operation above: Tubes vibrate deep in concrete. One unit, as shown, for each 5' (maximum) of slab width. Easily attached to finisher or spreader. GREAT FOR THICK, HEAVY AIRPORT RUNWAYS.



Shown above is the surface type tube in action (tube raised and lowered) IDEAL FOR HIGHWAY SLABS OF ALL WIDTHS AND THICKNESSES.

INTERCHANGEABILITY: Internal and surface vibratory units can be interchanged very quickly on a JACKSON PAVING TUBE.

SURFACE TYPE: Vibrates on the surface, accomplishing thorough densification of all concrete slabs of highway thickness. One unit, as shown at left, for each 6' (maximum) of slab width. Attaches to front of finisher.

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COMPRESSOR

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Year after year, Continental's famous dependability goes on building product acceptance for leading manufacturers of equipment. Here, for instance, an Ingersoll-Rand 85-cfm Rotary Compressor with Continental F-140 engine operates a PB8A Paving Breaker, using moil points, clay spades, and tamping bits, on a job in upstate New York. You cut costly down-time . . . do more work . . . with dependable Red Seal power.

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CONTINENTAL IS ON THE MOVE IN 1958

. . . Reader Comment

new roads. True, in the case of limited access interstate highways, there will be a lot of entirely new locations involved and old roads, in most cases, will continue to be used. But in many cases, the work is reconstruction or, at best, new construction on practically the same location as an old road.

I do not believe there is a direct relationship between the building of highways and the growth of our economy. What about other traffic of vital importance to our gross national product, such as air, water, and rail?

• **Damaging railroads?**—Perhaps by providing bigger and better highway facilities we are seriously damaging other types of transportation. For instance, recent responsible studies indicate that railroad plant and equipment expenditures will be 60% less this year than they were in 1957. That certainly will have considerable effect on the gross national product—and it is quite possible that a considerable amount of that decrease can be attributed to the expansion of our highway facilities.

I do not think the author can relate needed construction directly to increases in traffic volume or vehicle miles of travel. In a great many specific instances, paved highways have been able to carry considerable increases in vehicle miles without being over-taxed except during "commuter hours" or on holidays.

Also, we can not relate growth of traffic to volume of business done in arriving at needed construction because of the increasing carrying capacity of trucks and trailer combinations in the past several years. In this connection, vehicle miles would be no indication at all of business done.

We have yet to demonstrate that we can economically and efficiently handle highway construction under the present 13-year financing program. Until we develop the ability and capacity to spend the billions efficiently and economically, I see no need for increased highway appropriations. The acquisition of right-of-way alone is a tremendous road block and in many cases represents a criminal waste of the highway taxpayers money. I doubt if that is the only area in this huge construction program where the money is being squandered under pressure.

BEN H. PETTY
Professor of Highway Engineering
Purdue University
Lafayette, Ind.

CALENDAR

Hydraulics Division, American Society of Civil Engineers, 7th national conference, Georgia Institute of Technology, Atlanta, Ga., August 20-22.

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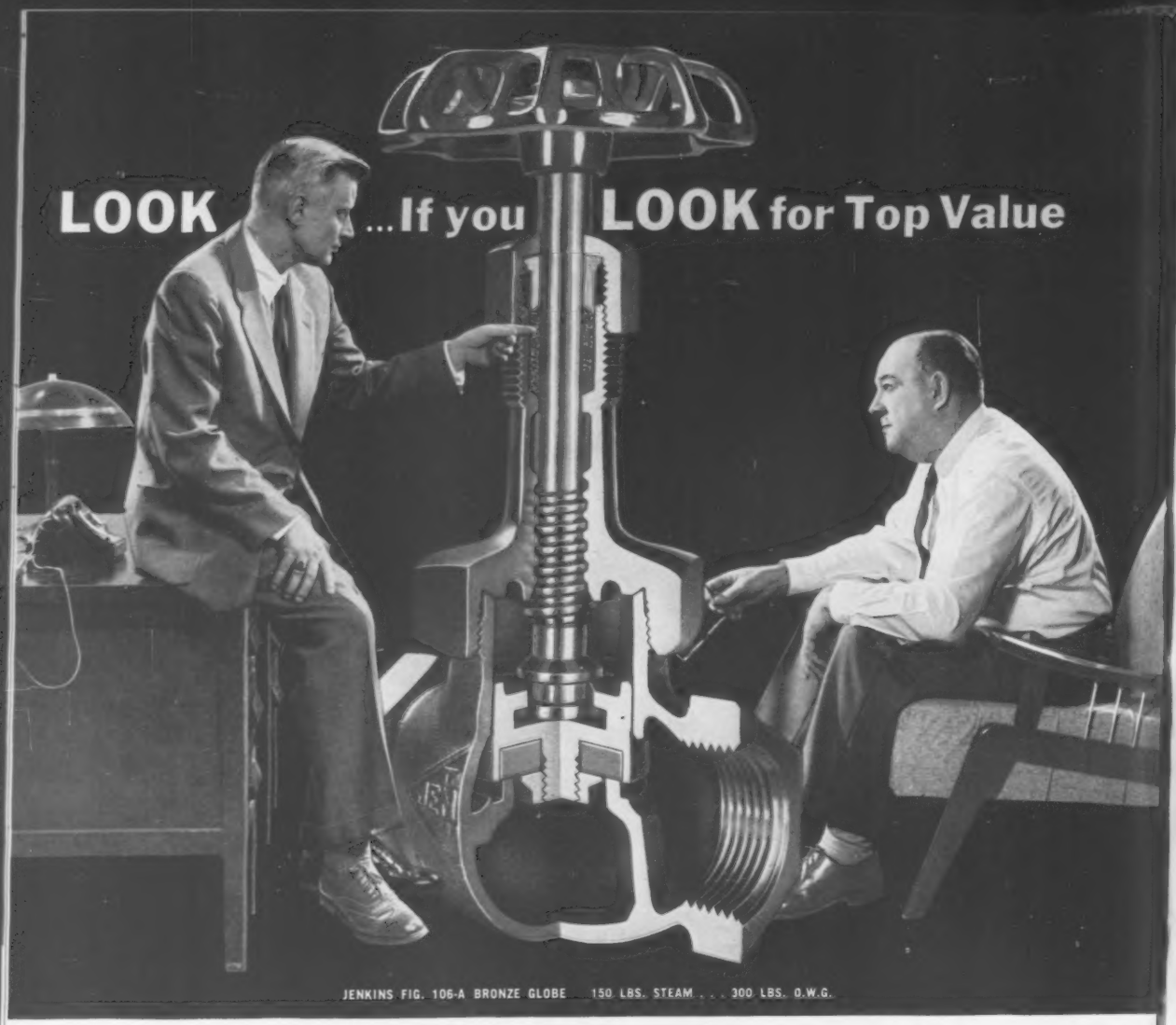


JENKINS FIG. 106-A BRONZE GLOBE — 150 LBS. STEAM . . . 300 LBS. O.W.G.

in Disc Equipped Bronze Valves

LOOK **at that Wheel** — Tough malleable iron. Design unequalled for cool, sure grip.

LOOK **at the Index Plate** — Has Fig. No. etched in green background. Held by wheel nut which is secured by rolled-over spindle end.

LOOK **at that Spindle** — Made of high tensile bronze. See how much heavier it is . . . how many more deeply cut threads engage bonnet. And, the crowned head that reduces friction on disc holder. Sure, it costs more to make a spindle this way. But it reduces wear, preserves packing, means easier operation.

LOOK **at the Packing Nut and Gland**—Note the heavy and deep bronze hex. And, that bronze gland designed to compress packing toward spindle.

LOOK **at that Packing Box** — Its depth equals 1½ times spindle diameter. More packing space means less repacking. An asbestos, lubricated and graphited packing is used.

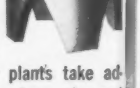
LOOK **at that Bonnet** — One-piece, screw-over design with big hex surfaces is easy to remove. Take an extra look at the bevel joint between bonnet and body, serving as an internal brace against the crushing effect of the bonnet assembly. Millions of Fig. 106-A in use for years prove this unique design licks distortion and springing.

LOOK **at the Disc Holder** — It's the Slip-on Stay-on type originated by Jenkins. Correct protective depth prevents flaking or cracking of disc.

LOOK **at the Disc** — Easily renewed without removing valve from line. Made of compositions to suit various services . . . and **made by Jenkins**, the only maker of both valves and discs.

LOOK **at that Body** — Just compare wall thickness of this high tensile bronze body with any other valve. The factor of safety is many times higher than rating requires. See the curved diaphragm to protect seat from distortion by pipe strain. Note that the raised seat is higher to permit more reseating operations . . . and wider, so it won't cut into disc. Pipe threads are full length and clean cut.

LOOK **at this . . . for Throttling**



—Just replace the standard disc nut with this Throttling Nut and a Fig. 106-A becomes well-suited to throttling service. This unique nut reduces the effects of wire drawing and its long legs restrict flow for accurate control. Many plants take advantage of this versatile valve to reduce valve and parts inventory.

THE FIRST renewable composition disc valve was a Jenkins Valve, originated nearly a century ago. Compare today's Fig. 106-A Bronze Globe with any other. See why so many valve users agree that a *Jenkins* is still the FIRST for top value. For descriptive folder No. 189-B on the full line of Jenkins Bronze Globe, Angle and Check Valves write to Jenkins Bros., 100 Park Avenue, New York 17.

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VALVES
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The same versatile all-steel buildings that gave Interstate Motor Freight System a new selling point through improved interchange, storage and service facilities can be tailor-made to serve your business, too! Whatever kind of building you need—factory, retail store, warehouse—Stran-Steel offers a handsome, firesafe building with a custom-built look at volume production savings.

Stran-Steel buildings have spacious, column-free interiors that will take cranes or monorails, insulate easily and need little upkeep. Their heavy galvanized roof and sidewall panels blend attractively with other materials like brick, wood, glass or matching Stran-Lite translucent panels. And they're up and ready for use in weeks, not months!

What's more, your Stran-Steel building works profitably for you as you pay for it. Pay only one-fourth down, balance on dealer's 5-year purchase plan! Leaves other credit lines open. Get the facts. Mail the coupon or call your Stran-Steel dealer. He's listed in the Yellow Pages under *Steel Buildings* or *Buildings—Steel*.

New 12-acre terminal for Interstate Motor Freight System and Prucka Transportation, Inc., includes huge 84-door 70′ x 552′ loading dock, plus 60′ x 160′ over-the-road garage and 50′ x 100′ city garage.

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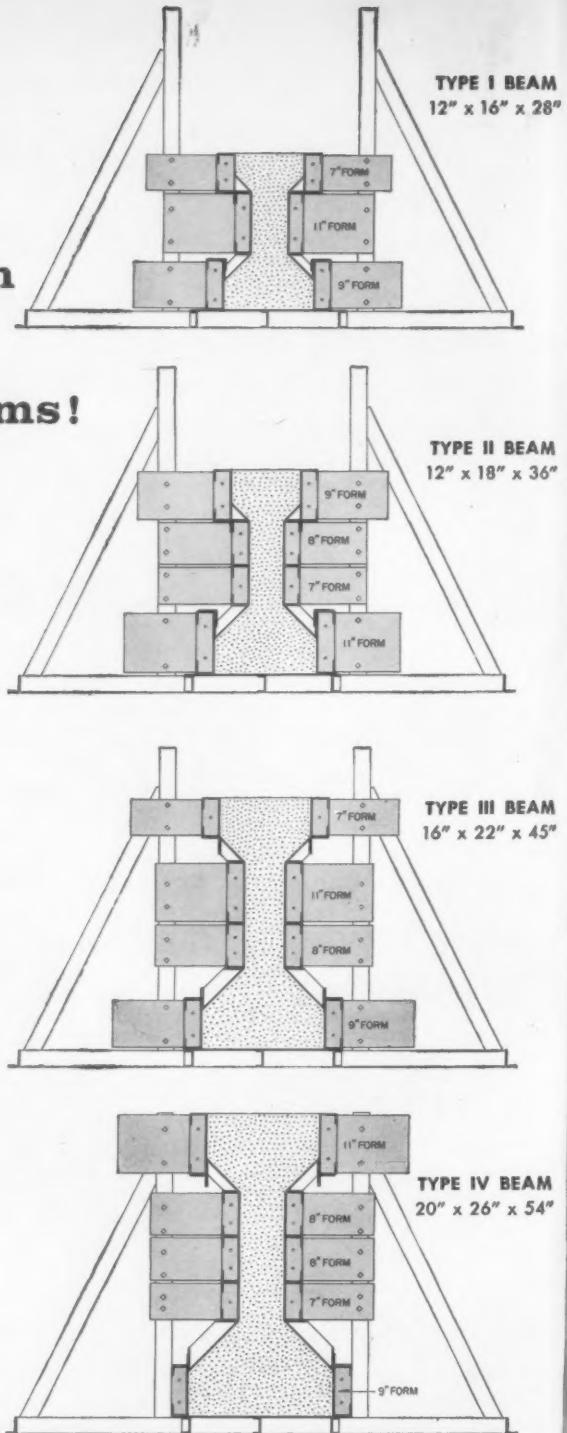
Now one adjustable Blaw-Knox Steel Form for casting all 4 sizes of AASHO bridge beams!

can be used for box-girders and building beams too

Now Blaw-Knox design leadership makes it possible to cast all four sizes of AASHO approved bridge beams in *one adjustable steel form*. In addition, the versatile form can be adapted to cast box girders, and a wide variety of structural beams. This means that pre-stress operators can cover bigger segments of the market with one basic investment in forms.

Starting with a pair of structural frames, side panels 7″, 8″, 9″, 11″ can be mounted vertically to form 28″, 36″, 45″ and 54″ bridge beams. The side panels can also be adjusted horizontally on the frames to manufacture additional products of varying contours and dimensions. Bevel panels, fillers, pallets, and end block forms are furnished to meet individual requirements.

Unit design with interchangeable components keyed to your individual business requirements make the Blaw-Knox *adjustable steel form* your best investment in the booming pre-stress market. You can get the full story by contacting the Steel Forms Department now.



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THE CONSTRUCTION WEEK

PRIVATE WORK OUTLOOK: BETTER—The future looks encouraging for contract awards in private work. June brought a big rise in new construction going on the darwing boards. This will show up in contracts in six to nine months. Private projects proposed in June had an estimated cost of $635 million, ENR figures show. That compares with $513 million in May, and only $465 million in June '57.

RECORD BREAKING—July contracts for highway and bridge construction are 13% higher than the previous record and 20% ahead of a year ago. With a week to go, July awards average $113 million per week. The old record was set last month.

BIG CANADIAN DAM TO START—First bids are expected to be called in August for construction of a $182 million multipurpose dam project on the Saskatchewan River in west central Saskatchewan. The province and the federal government just concluded an agreement to share the cost on a $110 million-$72 million basis. The dam will be 205 ft high and 16,700 ft long, making it the largest earthfill in Canada. It will form an 8 million acre-ft lake when completed six years from now, and in 20 years will bring up to 100,000 acres under irrigation. An associated powerhouse will have 150,000 kw capacity.

SANDWICH PANELS IN HOUSING—The NAHB Research Institute will start a second research house next month in South Bend, Ind. The first was built last year in Kensington, Md., initiating a tryout program for new materials, designs and construction methods. Principal feature of the second house will be a sandwich-panel structural system.

UNEXPECTED PROFIT—New York State's legislators had some misgivings when they authorized $30,000 last year for a research study to find ways of cutting the cost of public housing construction. But the study has already returned a profit of more than 3,000%. Over 100 cost-cutting suggestions came from designers and builders asked to help. One idea—for more careful screening of construction documents—lopped off $1 million from bids on a 2,000 unit project, reports State Housing Commissioner Joseph P. McMurray.

LIVING UP TO ITS NAME—It looks like Western Contracting Co., of Sioux City, Iowa, will break into the the growing West Coast dredging picture in a big way. The firm is now a big factor in Mississippi and Missouri River underwater work. Last week, it was low bidder at $4.5 million to clear East Mission Bay for the City of San Diego. The bid was more than $1 million below engineers' estimates. City officials said Western would move a 24 in. dredge to San Diego by flatcar.

US RUBBER

CONVEYOR BELTS

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

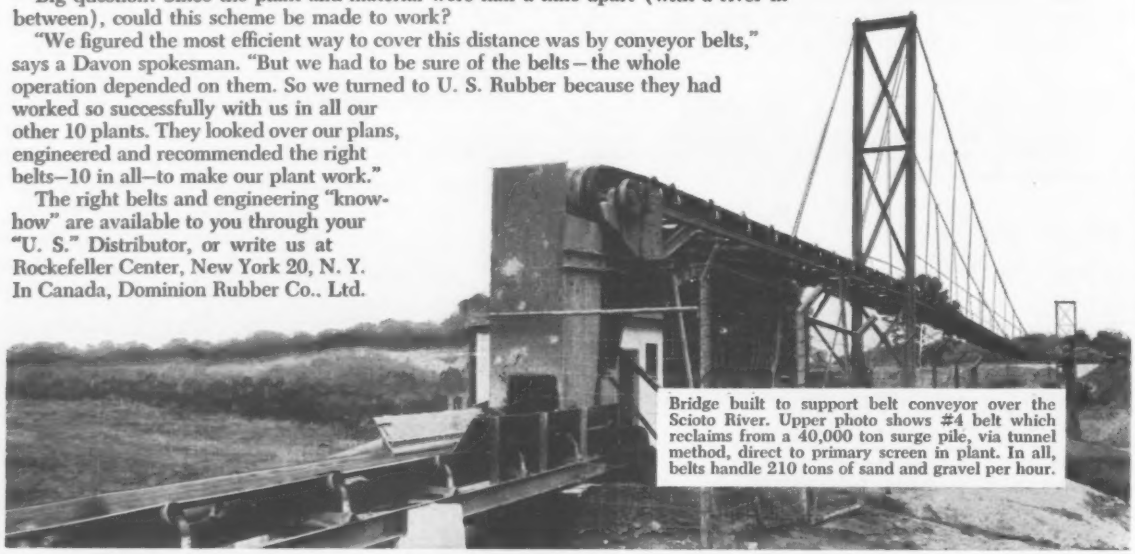
says director of sand and gravel company

When Davon, Inc., built its 11th plant recently, they decided it would be more economical to bring the material to the plant rather than the plant to the material.

Big question: Since the plant and material were half a mile apart (with a river in between), could this scheme be made to work?

"We figured the most efficient way to cover this distance was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts—the whole operation depended on them. So we turned to U. S. Rubber because they had worked so successfully with us in all our other 10 plants. They looked over our plans, engineered and recommended the right belts—10 in all—to make our plant work."

The right belts and engineering "know-how" are available to you through your "U. S." Distributor, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt which reclaims from a 40,000 ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.

US RUBBER

Mechanical Goods Division

United States Rubber

See things you never saw before. Visit U. S. Rubber's New Exhibit Hall, Rockefeller Center, N. Y.

WASHINGTON OBSERVER

- Fulbright bill chances dim
- Codification law moves
- Capehart activity increasing
- Wherry renovation about to begin

• **The Middle East crisis and the improved business picture have dimmed further chances that Congress will vote the big community facilities loan program (the Fulbright bill)** (ENR June 12, p. 136).

Early in the year, the Senate had shouted through a multi-billion program for federal loans to cover almost everything a state or municipality might want to build in the recession period. And the House Banking Committee some time ago put its own stamp of approval on the program. Now, Congress is losing its enthusiasm. It is a fair bet that the matter won't even come before the House for a vote. And if it did the President is now inclined to veto it.

The same fate appears ahead for the depressed areas aid bill, passed by the Senate and approved by the House committee (ENR July 10, p. 116). The business upturn seems to have put both on the shelf.

The foreign aid money bill, on the other hand, will get more sympathetic consideration because of the Middle East crisis. The Senate is expected to restore more of the money the House cut from the development loan fund, giving a total of more than $500 million.

—

• **The codification of various federal highway laws is moving ahead steadily through Congress.** That's the legislaiton that will pull into one package all highway laws passed since 1916.

Another bill moving along will help stimulate building activity: States will be able to buy up right-of-ways seven years ahead of construction instead of five years, as now limited. This will give states a chance to make plans more definite and reduce right-of-way purchasing costs.

The Senate Public Works Committee on Monday approved the House-voted measures. Final action will be taken before adjournment.

—

• **The Capehart housing program is moving upward.** By September 1, the military services expect to award contracts for 50 more projects costing $235 million. The Air Force will be the big contractor.

The boost comes as a result, primarily, of increased attractiveness of the 4¼% interest rate to private builders. The increase from 4% came in the emergency housing law Congress voted in the spring.

—

• **Rehabilitiation of the old Wherry housing program is getting under way.** The law providing for government guaranteed Capehart projects stipulated that the old privately built Wherry projects were to be taken over. Now the refurbishing is about to start.

So far, the military has acquired 44,000 Wherry housing units. The services have a tentative schedule for acquiring 21,000 more by next June 30. Rehabilitation will be primarily in heavying up wiring, painting and improving plumbing—with a ceiling of $3,000 per unit.

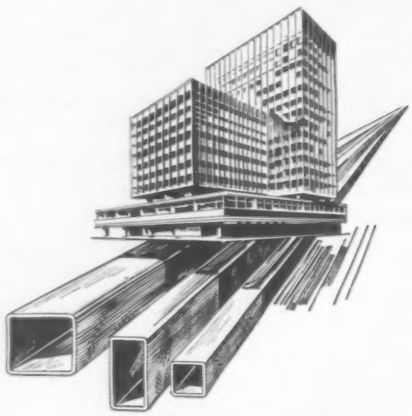
Once architect-engineers determine the renovations, the military services will call for bids to general contractors to do the work.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

One look at the newest buildings in your community, with their wide expanses of window area, and you realize the tremendous growth of curtain-wall construction in modern architecture. The results of curtain-wall or "skin" type construction have been greater design flexibility, more striking structures, more durable, weatherproof structures, with savings in space and weight, thus an overall saving in cost per square foot.

These savings have been effected through the development of new materials and the ingenious application of standard materials. Take, for example, the increasing use of welded steel tubing for framing and window supports. Standard sizes of welded steel tubing in square and rectangular shapes are appearing more and more in structures, from one-story school buildings to monumental skyscrapers. Welded steel tubing, with its lightweight-high-strength combination, has been most economically used in place of more costly structural members. This type of construction has been tested under tornado conditions with perfect success . . . proving beyond any doubt the weather-resistance, safety and effectiveness of its design.



Recently, we were asked by a customer to help solve a problem in curtain-wall tubing. The customer was buying from several sources and had difficulty in getting a uniform product. Radii and other dimensions varied drastically, causing many rejections. By specifying Revere Welded Steel Tubing, this customer tells us, these difficulties were overcome, and the Revere tubing has proved to be of uniformly excellent quality. Revere has been a major manufacturer of welded steel tubing for over 35 years and can produce practically all of the standard sizes of square and rectangular tubing used for curtain-wall construction, including the popular 2″x2″, 4″x4″, 2″x4″ and 2″x6″ sizes. Revere welded tubing also has the advantage of its uniform wall thickness being held to the close tolerances necessary in curtain-wall applications.

In addition to Welded Steel Tubing, Revere also supplies Revere Aluminum Extrusions for use in combination with the tubing in producing the steel tubing reinforced, aluminum covered panels, being used by many architects in curtain-wall skyscrapers with large window areas. Still another application of Revere Metals in curtain-wall construction is to be found in the 325,000 lbs. of Revere Architectural Bronze spandrel sheets used in the newly constructed 38-story, Seagram Building, New York, New York.

The use of Revere Welded Steel Tubing, Revere Aluminum Extrusions and Revere Architectural Bronze in modern curtain-wall construction are but three examples of "fitting the metal to the job." A function for which Revere has become well known and for which Revere's Technical Advisory Service is qualified to aid in the impartial recommendation of the right metal to do the best possible job at the least cost . . . whether it be welded steel tubing, copper, brass, aluminum or any of the other non-ferrous alloys . . . in building or for industrial use.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: **230 Park Avenue, New York 17, N. Y.**

Dams and bridges are keys in billion-dollar development program. They point up . . .

Construction's Stake in Iraq

The revolt in Iraq threatens the most extensive construction program ever undertaken in an underdeveloped country. If the program falters or fails, it will be the Iraqi people who will suffer.

This would be the real tragedy of the revolution.

Construction men must also recognize that the long-range outlook for pro-Western firms interested in Iraq is not encouraging, even if stability is restored under the revolutionary regime.

There are several hundred American construction people in Iraq now, probably more than in any other Middle Eastern country. Hundreds more have worked there in recent years or have been engaged on designs done in this country for Iraqi projects. Moreover, construction interest in Iraq is swelled by plans for a number of new projects now in the hands of prospective bidders in the U.S. and other pro-Western countries.

• **What will happen?**—Construction's stake in the outcome is substantial. This is highlighted by a cable from ENR's correspondent in Beirut, Lebanon, who reports the dim future outlook for pro-Western firms in Iraq. He says the new cabinet is made up of extreme nationalists, with strong anti-Western tendencies. They will probably revamp the important Iraq Development Board to get rid of Western-oriented old-regime technicians and the British, American and French experts who head the board's technical sections.

All new contracts will be subject to the same anti-Western influence, even though contracts already made with Western firms will be honored, according to assurances from the new government coming through to Beirut. But it would seem inevitable that American and Western firms will face stiff future competition from Iron Curtain countries, which previously have not been permitted to participate in Iraq's development projects.

The cable ends with the significant point that future Development Board activities will hinge on Iraq's continued oil revenue from the West. If Iraq's oil stops flowing westward for some reason or other, the country's entire five-year billion-dollar development plan will have to be greatly curtailed.

For More Background Information

Iraq:

Molding a Modern Mesopotamia, ENR Dec. 12, 1957, p. 34.

Big Dams Instead of Hanging Gardens, ENR Dec. 26, 1957, p. 32.

Lebanon:

Little Country With Big Construction, ENR Nov. 21, 1957, p. 28.

• **Who is there**—At ENR press time, believable news out of Iraq is fragmentary. Also checks with some of the U. S. offices of engineering and construction firms engaged in work there reveal little knowledge of the experiences of their personnel during the revolt, although the safety of all employees seems to be established. These firms include the following:

• **Tippetts - Abbett - McCarthy - Stratton, New York.** This consulting firm has the most extensive operation in Iraq of any U.S. firm. Its Iraq manager, Donald McCloskey, has 34 U.S. engineers on his staff. Including dependents, the total U.S. personnel is 90. About a year ago, the figure was near 200. The firm's now-finished contracts on grain

What Will Happen to These Iraq Jobs Out for Bids?

1. **Bridge near Mosul**
2. **Two complete villages on Musaiyab irrigation project**
3. **Housing projects (332 units), Mosul**
4. **Utilities and roads for Baghdad housing projects**
5. **Navigation locks on Gharraf Canal**
6. **Viscose rayon plant, Baghdad**
7. **Medical City, Baghdad. First unit 1,000 bed hospital**
8. **Batma Dam near Kirkuk, Lesser Zab River**

elevators and tobacco warehouses were then under way. Current work has been focused on investigation and program development for irrigation and drainage of the great Mesopotamian plain southward from Baghdad to Basra.

• **Litchfield, Whiting, Panero, Severud & Associates, New York.** This firm designed the $14 million Baghdad Medical Center, and has just put the first units of the project out for bids. It has no employees stationed in Iraq, since most of its Middle East design work is done in its Rome and Teheran offices.

• **Edwards & Kelcey, Newark.** Working with the U.S. Mission to Iraq as consultant to the Iraqi Highway Department, it has 20 U.S. personnel in Iraq, including dependents.

• **Kuljian Corp., Philadelphia.** This firm is handling irrigation investigations in the northern area in the vicinty of Mosul. It has six U.S. engineers, with nine dependents, in Iraq.

• **Morrison-Knudsen Co., Boise, Idaho.** It has about completed a 100 mile highway north of Basra. Number of U.S. personnel is down to a minimum. Six months ago there were about 75 Americans on the job.

• **Harza Engineering Co., Chicago.** It is supervising construction of $52 million Derbendi Kahn Dam, which it designed. And is carrying on field studies preparatory to design of Eski Mosul Dam. Harza has about 20 people, including members of their families, in Iraq. Calvin Davis, president, who spends about half his time in Baghdad, is in the U.S. James M. Bambara is manager of Iraq operations.

• **J. A. Jones Construction Co., Charlotte, N. C.** It heads the U.S. combine that is building Derbendi Kahn Dam. J. C. Petern is project manager and R. D. Hilliard is project engineer for the combine, which also includes the Chas. H. Tomkins Co., Washington, and the Tecon Corp., Dallas.

• **Ibec Housing Corp., New York.** This Rockefeller company, which helped Iraq extensively on its experimental housing, has only Iraqi personnel in Baghdad. Its American engineers moved to Teheran several months ago on some new work in Iran.

• **Development was all important**—Beyond concern for the safety of U.S. engineers and construction people in Iraq, however, toppling of its government is a matter of prime interest—over and above its obviously serious impact on world politics. The development plan was so predominant in Iraq's recent mode of life that it absorbed almost three-quarters of the country's revenues and a comparable amount of the national energy.

Serious development work began in 1950 when Nuri as-Said, the prime minister who was murdered in the revolt, formed the Iraq Development Board and assigned the bulk of the country's oil revenues to its use. An American irrigation expert, Wesley Nelson, was made an executive member of the board and had much to do with setting it up as an effective organization and formulating plans for a large variety of projects.

Five technical sections were set up in the board: (1) Irrigation and Drainage; (2) Roads, Bridges and Buildings; (3) Industries and Power; (4) Agriculture; and (5) Housing. At the time of the revolt, Section 1 was headed by an American, Kenneth F. Vernon, Section 3 by a Frenchman and Section 5 by a Greek. Iraqis headed the other two.

In its first five years the board spent about $250 million on design and construction. Its current five-year program is in the neighborhood of $1 billion, about a quarter of which is under way.

Objective of the development plan was to make-over the entire economy of the country, and particularly to raise the living standards of the impoverished majority of the population. The key to this enlightened program was control and utilization of the ample water available in Iraq's two main rivers, the Tigris and the Euphrates.

Substantial progress in controlling flood waters was achieved by construction of dams above Baghdad, which divert the waters into desert depressions. Conservation was next, and a program of reservoir construction on the upstream tributaries was undertaken. Then as a final step, to bring thousands of acres of farm land into use in the ancient Mesopotamian plain south of Baghdad, irrigation and drainage canals were being designed and put under construction.

To supplement this agricultural development, plans were made for industries to utilize farm products and to exploit the natural resources of the country. As a corollary, power had to be developed using Iraq's ample supplies of natural gas and oil. A transportation net of highways also had to be created. Schools, hospitals and public buildings were another vital part of the plan. And last, but not least, decent housing was needed in the cities and villages, and on the new farms.

Remarkable progress had been made in bringing these objectives nearer. The accompanying map shows some of the water projects; bridge locations suggest the extensive highway work under way. In addition, new grain elevators in the north of the country give farmers a place to sell and store their grain, while tobacco warehouses perform the same service for this crop. Modern port facilities in Basra were being constructed for shipment of products and merchandise. Schools had been built by the dozens and several housing proj-

Reported Killed in Baghdad

George S. Colley, Jr., 56, senior vice president and director of The Bechtel Corp., San Francisco, was reported killed in Baghdad, Iraq, during the revolt.

Bechtel officials think Mr. Colley was there to change planes after visiting Bechtel work in Saudi Arabia and Kuwait. Bechtel has no projects in Iraq.

Mr. Colley was the principal Bechtel officer for overseas work, with headquarters in San Francisco. He graduated from the University of California in 1926 with a degree in mechanical engineering. He leaves a wife and two children.

cts of more than 1,000 units each were under way.

In Baghdad, two new bridges were in service across the Tigris, a 1,000 bed hospital was getting under way, public buildings were in various stages of construction, and a large opera house and a modern university were in the works. Several power plants were in operation, as well as cement mills and an asphalt refinery. Under construction were a sugar refinery and a sulphur plant.

• **Troubles**—In a program so vast and varied, it was inevitable that differences of opinion would arise over the kind of projects to be pushed first and fastest. Some were popular with the peasants, some with the wealthy landowners, others were strictly political.

For the most part, Prime Minister Nuri as-Said controlled decisions in dictator fashion. That they were more often than not logical and wise decisions did not matter. He made many enemies—and some of them proved to be deadly in the revolution.

The new regime professes support of the technical activities of the board and vital concern with continuing the development program. But the Development Board was so much Nuri's board that changes in its operation—and even objectives—seem inevitable.

Construction's future stake in Iraq depends on the nature of these changes.

. . . And in Lebanon

Construction's stake in Lebanon, where the U.S. Marines have landed, is not so great as in Iraq. The country is much smaller and our foreign aid operations there have been temporarily dormant.

A survey for a new motor road over the mountains from Beirut to the Syrian border was recently completed by Tippets-Abbett-McCarthy-Stratton—American engineers. But other American engineers have not been active there since a Bureau of Reclamation group did a preliminary design for a dam and tunnel project to utilize the water of the Litani River for power and irrigation in the Bekaa Valley and along the seacoast. French designers and an Italian contractor are now in charge of the first unit of the tunnel.

In Beirut, however, commercial and apartment building has enjoyed a boom. As a result the city is the showplace of the Middle East. One of the new hotels, yet unfinished, is of American design and ownership, but most other buildings are of European origin and local or Middle East ownership.

Lebanon needs a good many facilities that construction men could supply, given the proper conditions and a peaceful climate. Only last week, the U.S. promised further economic aid.

Low-Cost Housing Leads the Way

Builders and buyers have rediscovered the low-cost house. The Federal Housing Administration's latest survey of builders across the country shows that more low-cost homes are being built and bought than last year.

Two key facts stand out in the survey:

• Builders are adding to their low-cost home program in 62% of the areas surveyed, compared with 27% of the areas last year.

• Sales of low-cost homes rose to 19% of new home sales, up from 14% in the 1957 survey. Both high-priced homes and moderate-priced homes showed sales declines in this period.

The survey is taken each July in cities where FHA insuring offices are located.

Results also show greater interest now in moderate-priced housing. Plans are advanced in 62% of the areas, compared with 37% a year ago.

Industry sources confirm the trend to low-cost homes. Here are the major reasons:

• The new housing bill, with its extremely liberal down-payment requirement of only 3% is bringing more people into the $13,500-and-under housing market.

• This market was always big and attractive, but in the last two years of tight money many builders left the FHA housing field.

"We were building above the biggest market," one homebuilding specialist says. "Now things have changed enough that it's profitable to come back."

Moderate-priced homes still account for a majority of new sales, but dropped in July to 60% of the total, from 62% a year ago.

High-priced home sales, which had 24% of the total last July, dropped to 21% this year.

That leaves low-priced homes accounting for 19% of new home sales—a pickup of five percentage points from July 1957.

Other highlights of the survey:

• Nationally, low-priced homes now are generally regarded as those selling under $11,400. Regional variations make this $10,000 in the Southeast to $12,800 in the North Central states. The average opinion defined high-priced homes as those selling over $17,800, but in the Southeast the breakpoint was put at $16,200, and in the North Central area at $19,400.

• Two-thirds of the areas reported sales of new low-priced houses take place within 30 days of completion. In all but a few areas, moderate-range homes sell 30 to 60 days after completion. High-priced homes are being sold in 30 to 60 days in the Southeast and Southwest, but "after 60 days" in most other areas.

• More than 80% of the respondants indicate stable selling prices for new and existing homes in all three price groups. Among the remainder, advancing prices outweighed declines in all price classes of new homes and in most existing homes. Only in high-priced existing homes do the field reports indicate price declines exceed advances.

Nuclear Desalting to Be Studied

The fresh-from-salt water research program moved into the nuclear age last week. Reason: Announcement of a joint engineering study by the U.S. and the State of California into the costs and technical feasibility of a 10 to 20 mgd nuclear-power sea water conversion plant.

The study will be conducted by the Fluor Corp., Whittier, Calif., under a contract awarded by the federal Office of Saline Water and California. The federal government will put $57,985 into the joint venture this year; California is investing $40,000. The contract is for one year, but it can be extended. Main objective is to learn whether use of heat from a nuclear reactor can produce fresh water at a cost competitive with fresh water obtained from conventional sources. As in current salt water distillation plants, there is the prospect of using nuclear-produced for byproduct electric power generation.

The plant design to be studied by the Fluor Corp. would be the largest conversion unit so far researched under federal sponsorship. If the study proves out, there are big plans afoot to build a $70 million full-scale demineralization plant on a federal-California-private industry basis. If not, the desalting hopefuls would push for a less expensive conventionally fueled prototype.

Recent estimates put the cost of converting water in a 10 mgd plant at about 50 cents per 1,000 gal—using a conventionally-fueled Badger distillation process now being studied on a laboratory scale. But a big technical problem remains—how to prevent damaging scale formation in the Badger still.

This week, the Office of Saline Water awarded a basic research contract to the University of Michigan at Ann Arbor to look for a solution to the scale deposit problem. As of now, the only known method of reducing such scale is by using very costly nickel alloys in the distillation tubes.

A-Power Market Gets Big Boost

Congress passes $386 million nuclear authorization, looks to $1.5 billion program in next seven years

The Democratic-controlled 85th Congress is pouring hundreds of millions of dollars into the nation's atomic power development program. And private industry is expected to put up a good many more dollars than presently planned to keep its oar in.

All this adds up to between $1 billion and $1.5 billion of nuclear power projects in the next five to seven years. This will be shared by hardware supplies and construction firms.

Probably 12 to 15 years will elapse before atomic power construction becomes really big business.

The House and Senate have passed legislation authorizing the Atomic Energy Commission to spend $386 million for new facilities. This is double the amount requested by President Eisenhower. The lawmakers will vote most of the necessary appropriations in separate legislation.

The major portion of the authorization bill is concerned with reactor development projects and facilities for production of special nuclear materials. Only two sizable reactors are involved: a $145 million plutonium producing reactor at AEC's Hanford, Wash., Works and a $51 million gas-cooled 40,000 kw power reactor to be built either by AEC or private enterprise.

However, the next five years are expected to see construction of a score or more power reactors, with the federal government taking the lead if private enterprise fails to respond to incentives offered.

• **Disappointing progress**—The progress of atomic power development has been a source of continuing controversy between the Republican-run AEC and the Democratic Congress ever since President Eisenhower took office in 1953.

Five years ago, there were only two small experimental reactors producing barely enough power to meet their own plant requirements.

To atomic enthusiasts, progress since that time has been disappointing. They note there are still only eight completed power reactors producing less than 100,000 kw. Most of this comes from the recently dedicated plant at Shippingport, Pa.

Lagging development is attributed to two main factors:

First, compared to areas like Western Europe, the conventional energy sources in this country—coal, oil and natural gas—are cheap and plentiful. The cost of reactors also has turned out to be much higher than had been expected.

The experts generally agree that competitive atomic power in this country is at least 10 years off even in areas where conventional power costs are high.

The Eisenhower Administration, backed by the private utilities, holds that federal activity in the atomic power development field should be limited largely to research in support of private reactor construction. Under this policy, plans are already in the works to bring the number of civilian power reactors to 23 by 1964, with a total capacity of 1.3 million kw.

Democratic claim the incentives are simply not enough to attract sufficient private utility interest in atomic plant construction. They say the government must build or finance several generations of reactors—up to large-scale plants—if the U.S. is to be ready for the day when atomic power will be an economic necessity.

The tug-of-war over the issue has been about a draw, but there are important signs the Democrats are now getting the edge.

The fiscal 1959 authorization bill calls for more than two big reactors. It also requires AEC to submit design studies on five more. This will open the way for possible authorization next year of more federal reactors.

Beyond that, the Democratic-led Joint Committee on Atomic Energy is cooking up a long-range program calling for private or government construction of 10 to 12 power reactors with a capacity of some 1 million kw—and costing well over a billion dollars. This is in addition to the reactors already being built or scheduled for construction.

• **Long-range**—Both the atomic industry and Democratic enthusiasts foresee construction of a succession of big reactors from 1963 to 1968, capable of 200,000 to 300,000 kw each.

At the end of this period, they feel high costs—mostly a matter of extremely expensive fuel elements—will be lowered and atomic power plants will become competitive in areas like New England and the upper Midwest where fossil fuel generation costs are high.

The National Planning Association, a non-profit private research group, recently estimated that three-fourths of the new power plant capacity built between 1975 and 1980 will be nuclear. By that time, 29% of all thermal-generated electric power is expected to come from atomic plants.

NPA's experts expect the atomic industry to represent a $10 billion investment in 25 years—most of it in power plants.

Construction Man Heads AEC

The man who will guide civilian atomic development for the next five years is a quiet California builder and industrialist with a reputation for getting things done. He is 56-year-old John A. McCone, who succeeds Admiral Lewis A. Strauss as chairman of the Atomic Energy Commission.

Mr. McCone became well-known to construction men during World War II when the Bechtel-McCone-Parsons Corp. pioneered the design of huge yards for prefabricated ships.

The San Francisco native got his start as a construction engineer at the Lewellyn Iron Works in the 1920s and rapidly moved up the ladder to become executive vice president of the Consolidated Steel Corp. In 1937, he organized the Bechtel-McCone Corp. of Los Angeles.

Since 1945, he has been president and director of the Joshua Hendy Co. and the Joshua Hendy Iron Works. His interest in Joshua Hendy has been placed in a voting trust to avoid any possible conflict of interest with his new public post.

Although a prominent Republican, John McCone also served in the Truman Administration—as deputy to the Secretary of Defense in 1948 and later as Under Secretary of the Air Force.

John A. McCone

New, low-cost belt conveyor now available in lengths to 102′

If you handle bulk materials, you should have a copy of the new Barber-Greene Transfer-Conveyor Catalog. With it, you can readily select your own conveyor. Belt width and horsepower are automatically correct for your job.

The Barber-Greene Transfer-Conveyor has cut costs on so many jobs that its range has now been extended to 102′ in 1′ increments. Belt widths are 18″, 24″ and 30″.

Because the Transfer-Conveyor is pre-engineered and made up of standardized components, special engineering time and expense are eliminated, and shipment is from stock—usually from the local distributor's stock. Erection is merely a matter of bolting the major components together and positioning the conveyor. Sectionalized construction gives flexibility for lengthening or shortening to meet future requirements.

Other Transfer-Conveyor advantages include:

- Rigidly braced channel frame allows 7′ overhang at head end, 18′ spans between supports.
- Head and tail end sections shipped completely assembled, aligned and adjusted.
- Heavy-gauge steel decking protects return run of belt.
- Worm gear reducer, running in oil, cuts maintenance expense.
- Ball-bearing carriers assure long, trouble-free life.
- Heavy thread screws provide belt tension adjustment.
- Parts interchangeable and repair parts readily available.

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Doubled Sewage Aid Bill Moves

Powerful House committee votes $100 million a year to municipalities as second year of aid program ends

Congressional plans to speed up the government's attack on muncipal sewage problems moved from the talking to the action stage last week. The House Public Works Committee approved a five-point subcommittee bill designed to double the annual amount of federal grants for construction of local sewage treatment plants. The bill also eliminates several restrictions on allocation of funds in existing water pollution control law.

Despite White House opposition to the program, Congressional leaders are hopeful of voting the increases before adjournment. Plans are afoot to bring the bill to an early vote in the House, where strong bi-partisan support awaits any move to improve this program. The outlook for passage is less certain in the Senate. But supporters, led by Democratic Senators Kerr, Chavez and Humphrey, think they have by turning responsibility over to the states the votes for an expanded program.

Few congressmen—Democrat or Republican—are taking seriously recurrent threats by the White House to end the federal grants program.

As approved by the influential Public Works Committee the House bill:

- Raises total federal grants authorized to $1 billion over a 10 year period, with a yearly maximum of $100 million, starting July 1, 1959. The law now allows $500 million for 10 years, with a yearly maximum of $50 million, starting July 1, 1956.
- Limits maximum grant to any one project of 30% of the total cost or $500,000, whichever is smaller. The law now sets limits at 30% or $250,000.
- Permits local communities to band together for joint grant application—with each community eligible for 30% or $500,000 in aid. Law now bars pooling.
- Permits U. S. Surgeon General to re-allocate funds alloted to any state or territory that are unused at fiscal year's end. Law now prohibits this.

The possibility of a White House veto exists, of course, but these points weigh against such Presidential action:

- The President's plan for turning the sewage works aid program over to the states received a rather chilling reception from most state governors at last May's Governors' Conference in Miami.
- Administration opposition—as Congressional Democrats see it—rests mainly in one man: Presidential Aide Sherman Adams. Even if the beleagured Mr. Adams is still in the White House next month, his views can no longer be expected to carry the same weight they did in the past.
- The sewage grants program has lost much of its controversial character in Congress, even among Republicans; Congressman Blatnik (D., Minn.) got his Public Works Committee to okay the bill after only brief debate by a 21-7 vote. The seven Republicans against it indicated they were voting more "for the record" than out of serious conviction.
- Mr. Blatnik and most Congressional sponsors of the expanded grants program have carefully avoided any attempt to sell the proposal as an "anti-recession" program. Instead, they've pitched their arguments to the claim that a bigger program is needed to cope with pollution control problems—an effort to sell the program on its merits. So, the chief argument for or against the revised program will be little affected by the economic situation.

The U. S. Public Health Service, which administers the grants, sees immediate benefits from adoption of the restriction-easing provisions in the proposed legislation. These could make a $10 million difference in the amount of federal aid given to local sewage treatment projects in the current fiscal year, which began July 1.

PHS officials also see the start of a trend toward more active participation by the bigger cities in the federal grants program. The raising of the maximum grant figure in new legislation is certain to encourage this trend.

Construction Grants: Where They've Gone

State	First year to 7/57	Second year to 7/58
	(Number of projects)	
Total	446	592
Alabama	6	8
Arizona	6	9
Arkansas	5	24
California	23	13
Colorado	5	13
Connecticut	3	3
Delaware	1	5
Dist. of Columbia	1	3
Florida	8	8
Georgia	11	7
Idaho	4	7
Illinois	14	19
Indiana	11	6
Iowa	15	14
Kansas	17	11
Kentucky	8	11
Lousiana	9	11
Maine	1	3
Maryland	7	8
Massachusetts	6	5
Michigan	11	19
Minnesota	10	10
Mississippi	11	4
Missouri	23	16
Montana	4	16
Nebraska	2	23
Nevada	2	0
New Hamphire	4	4
New Jersey	6	7
New Mexico	10	10
New York	20	20
North Carilina	12	13
North Dakota	19	30
Ohio	15	20
Oklahoma	14	12
Oregon	11	10
Pennsylvania	11	16
Rhode Island	3	3
South Carolina	8	12
South Dakota	11	19
Tennessee	6	9
Texas	20	20
Utah	0	7
Vermont	2	3
Virginia	7	31
Washington	13	16
West Virginia	0	12
Wisconsin	14	24
Wyoming	6	15
Alaska	0	0
Hawaii	1	1
Puerto Rico	9	2
Virgin Islands	0	0

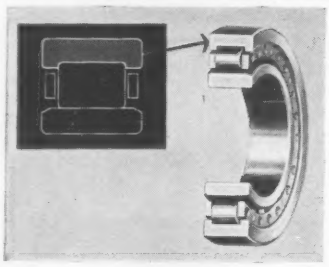
Source: U. S. Public Health Service

How the Grants Are Working

A brief recap of the record demonstrates the growing role of the federal grants program in the national sewage abatement picture (see table). In the first year of operation, which ended June 30, 1957, PHS offered $37.9 million in construction grants covering 446 projects with a total project cost estimated at $166.8 million. Local communities put up the balance, $128.9 million. That's between three and four local dollars for each federal dollar.

In the second year, with federal-state administration of the program operat-

Loggers' "weight-lifter" tests bearing stamina!



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Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability —keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

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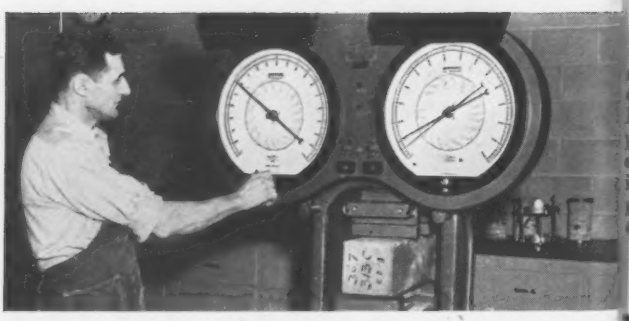

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Actual cost figures for the two types of pavement tell the story! Indiana Toll Road engineers drew up designs for both types of pavement . . . each to carry the same axle loads, each to be the best of its type. Realistic comparison of *all* paving costs, from grading and subbase preparation to finished surface, gave the answer: *Concrete would save $62,436 per mile!*

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. . . Second year look

ing more smoothly, PHS was able to offer $47.4 million in grants—covering 592 projects with a total estimated construction cost of $285 million. The hoped-for stimulation of local spending—the basic philosophy underlying the grants program—was working more effectively as each federal-aid dollar was matched by slightly more than five dollars by city hall.

So far, few of the 1,038 projects offered grants in the past two years have been completed. But well over half have been started. As of June 30, 1958, PHS reports 149 completed treatment plant projects and another 507 under construction. That's a sharp step-up from a year earlier, when only four had been completed and 141 others launched.

Public Health Service officials feel the existing five-to-one ratio of local to federal dollars is unlikely to become much larger, particularly if the Blatnik bill becomes law. And there's a chance it could narrow a bit. A lot depends on whether the expected trend toward more projects from larger cities proves out.

PHS figures that one reason for the lack of larger projects is that it takes considerably longer to prepare engineering plans for a large project. The grants program is still less than 24 months old. Smaller communities probably were able to move more quickly with their applications for grants.

Officials have not spotted much change in the average size of individual project grants. Since the program began. As of June 30, 1958, 79% of the number of federal grants went to communities of 10,000 or fewer residents.

Authority to re-allocate unused federal funds from one state to another would come at a welcome time. Nearly $10 million of federal money, appropriated over the past two years, hasn't been allocated. That's because some states and territories have failed to use their full allotments. Unless the laggard states pick up that money this year, or Congress permits the U. S. Surgeon General to reallocate it at year end, this money reverts to the Federal Treasury.

Federal officials frankly expect such losses—$8 to $10 million—if denied the opportunity to re-allocate. The fact is that a number of states and territories simply can't use the money for the purposes it was appropriated.

If Congress passes the Blatnik bill and makes the money available, too, the Public Health Service has no doubt it could spend at the higher rate. Officials are also confident it would prove a real stimulus to construction—generating some $600 million of treatment plant building (in addition to projects not aided by the federal program).

Frogmen Extend Outfall in Ocean

Frogmen carried by helicopter are blasting a trench in the rocky ocean floor near Newport, Ore., to extend a 20 in. dia paper mill waste line 1,800 ft farther away from the shoreline.

At present the line from the Georgia-Pacific Paper Co. mill empties 1,100 ft offshore. The outlet end is at mean low tide. At minus tides, pools of brown, foamy wastes are left on the beach. The extension was ordered soon after the original line began operation and beach property owners complained (ENR Apr. 3, p. 30).

An underwater demolition team is now cutting through several dikes of rock to form the pipe trench. Some of the cuts underwater are as much as 12 ft deep.

The helicopter carries the frogmen and explosives to rafts offshore. Each charge is placed after signal from a transitman on the beach. The job may take all summer as the rock is basalt and each charge breaks up only a few feet. A 900 lb charge has been the largest exploded so far.

How the pipeline will be laid or anchored has not been decided, but it will have to be heavily anchored to stand the surf. and strong currents in the area.

Helicopter carries frogmen to work.

The extension may cost $50,000. Georgia-Pacific has already spent $750,000 in building the waste line 8½ miles from the plant to the shoreline, which is in Yaguina Bay.

Seek School Building Control

A special committee of Delaware's state legislature recommends that school construction responsibilities be turned over to a special Public School Construction Commission appointed by the governor.

A bill proposing establishment of such a commission has been submitted to the House Education Committee for consideration.

The committee says school construction costs are beyond the control of local school boards. The proposed commission would exercise tight control over spending. If a school required major alterations, or if a new school were needed, the local school board would have to obtain a certificate of necessity from the commission. The commission also would have the final word on preliminary plans for district schools.

The large size of the school program has pushed up construction costs, the committee reports, because of the limited number of qualified architects and contractors available. The report recommends stimulating competition by limiting the amount of school construction started at any one time. Bids for school construction are currently scheduled at the rate of one a week for all of this year.

Committee members criticized "extra frills" in some schools. These include "special trim, specially designed classrooms, windows, ceiling, floors; and special-purpose rooms such as music rooms, music practice rooms, teachers' lounge, separate gymnasium, separate auditorium, separate cafeterias and special libraries."

Without these features, the report says "a school board could build a modern and adequate school at moderate low cost without sacrificing the essentials necessary to educate the child."

Flotation Inadequate For Denver Sewage Plant

Denver is planning to build an $8.5 million secondary sewage treatment plant of standard design. The decision came after a $50,000 pilot plant study showed a far less expensive flotation process (ENR June 6, 1957, p. 28) would be inadequate.

In the flotation process, which would have cost about $1.5 million, air bubbles lift solids to the surface where they are skimmed off. Besides separation, the solids are aerated and oxidized, speeding their decomposition.

The additional standard secondary treatment facilities will be installed at the city's two main plants, which handle a total of 50 mgd.

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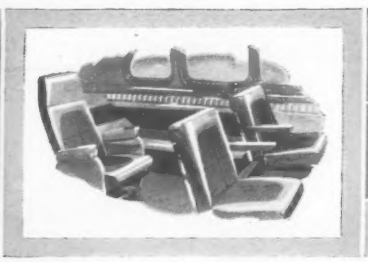

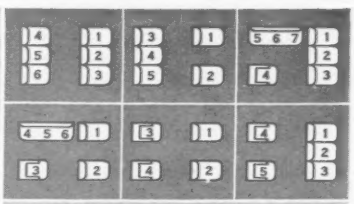

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Foundation Design and Methods Cut Skyscraper Cost

CHASE MANHATTAN BANK tower will rise 60 stories from street level plaza.

Robert C. Johnston
and
Nicholas W. Koziakin
Moran, Proctor, Mueser & Rutledge
Consulting Engineers
New York City

The perimeter cofferdams for the largest deep foundation job in downtown New York City were completed without compressed air. The substructure for the new Chase Manhattan Bank headquarters, more than 6½ stories deep below street level, will support a 60-story tower and penthouse.

Chemical soil grouting eliminated expensive pneumatic caisson work during exterior wall construction. Bracing these walls with the permanent building frame during construction minimized costly temporary bracing.

The entire site, roughly rectangular, 170 x 390 ft, with a large dog leg off the south end will cover most of two blocks (bounded by Nassau, Liberty, William and Pine Streets). An existing street (Cedar) will be eliminated where it crosses the site. The tower, 107 x 281 ft, will rise 800 ft without setbacks from the center of the site. Nearly two-thirds of the site at street level will be developed as a plaza. Below ground, the entire site will be used for basements. The face of the building will be dominated by the exterior columns, placed outside the glass and metal curtain wall. In this manner, the architects will emphasize the straight rise of the building, and also add to the flexibility of the floor space.

The work in progress—the foundations and tower of the main building—is the first of two construction phases. The substructure and plaza area on the south side of the main tower will be built later. The entire project will cost $121 million.

• **Varied subgrade**—An extensive boring survey was made to define the soil strata for development of the foundation design and construction procedure. This disclosed many heavy equipment and building footings at both ends of the block. In the center was an old pneumatically constructed cofferdam with caissons sealed in bedrock.

Fine, loose, reddish brown sand was found down to 20 ft below the ground floor. (The new ground floor will be at street level on one end and 12 ft below at the other.) Under this was a layer of sandy silt, known in New York City as "bull's liver." This extended to a hardpan stratum 40 to 50 ft below.

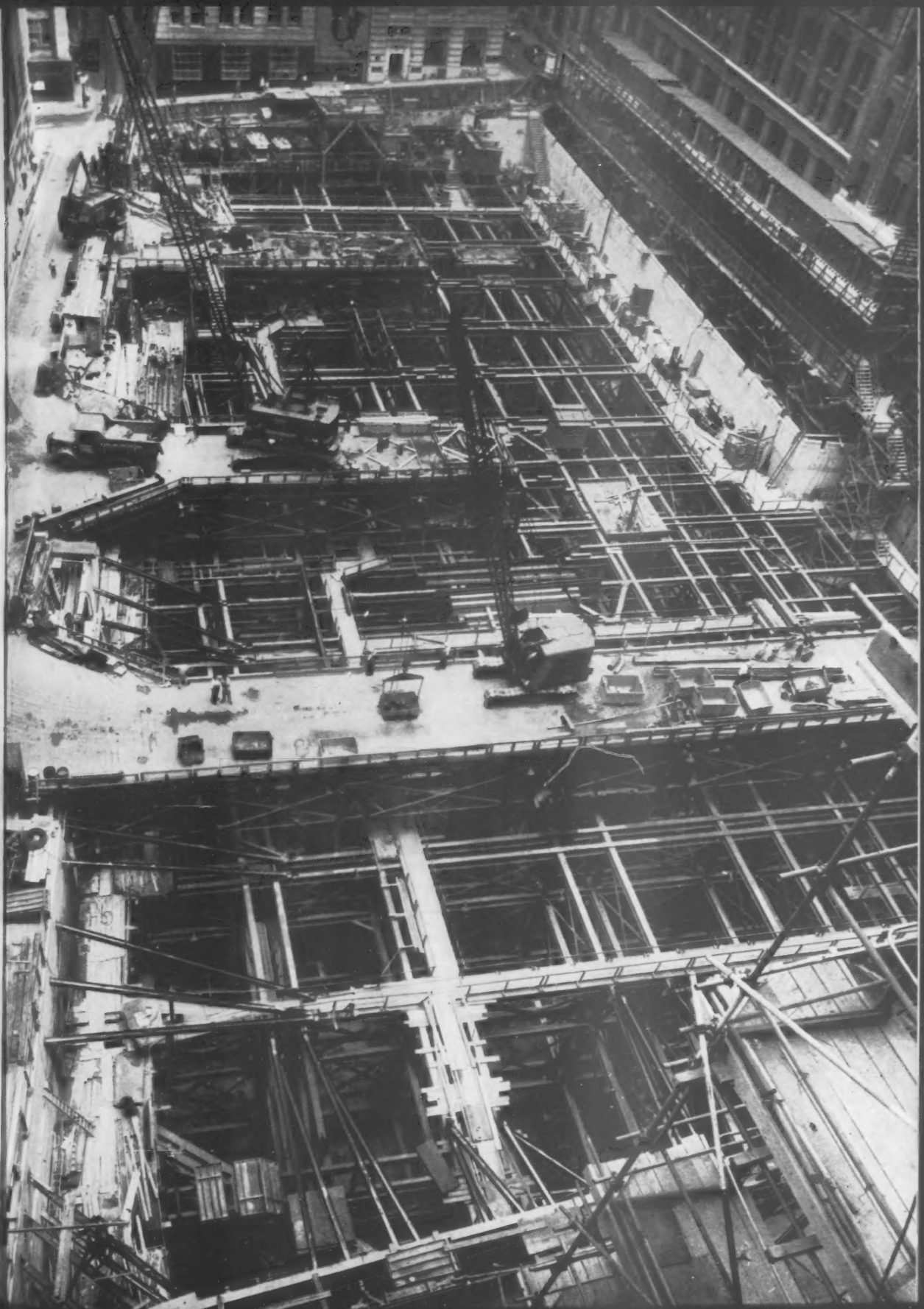
At one end of the site, the hardpan is in contact with bedrock. At the other end, the hardpan is thinner and underlain with a bed of compact, medium-fine sandy silt and boulders. In the past, this stratum, under a hydrostatic head, often has required builders to use pneumatic caissons to prevent loss of materials from under adjacent streets.

Supplementing the normal boring program, a series of piezometers were installed in selected borings so water levels could be determined accurately. Groundwater was found at two different elevations. The upper level was above the hardpan in the sand and bull's-liver area. The lower level was within the hardpan stratum. This lower water exerted hydrostatic pressure in the permeable material between the hardpan and bedrock at one end of the site.

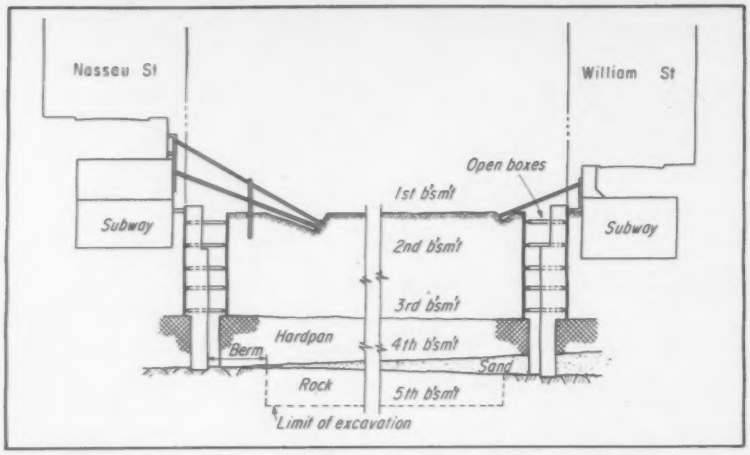
• **Pneumatic caissons considered**—The exterior walls at the east end of the site had been designed at first as 12 large pneumatic caissons. This had been done because of previous success in the area with that method. Also, speedy construction of the foundations was a basic requirement. Conversion from open to pneumatic methods, if necessary, would have delayed work once the job was started.

At the other end of the site where no granular materials underlaid the hardpan, the design called for open steel sheeted boxes down to hardpan and horizontal breastboards through the hardpan to bedrock. These boxes and caissons at opposite ends of the site—with the basement walls from the old building in the center of the site—formed an open trench in which the permanent walls could be built.

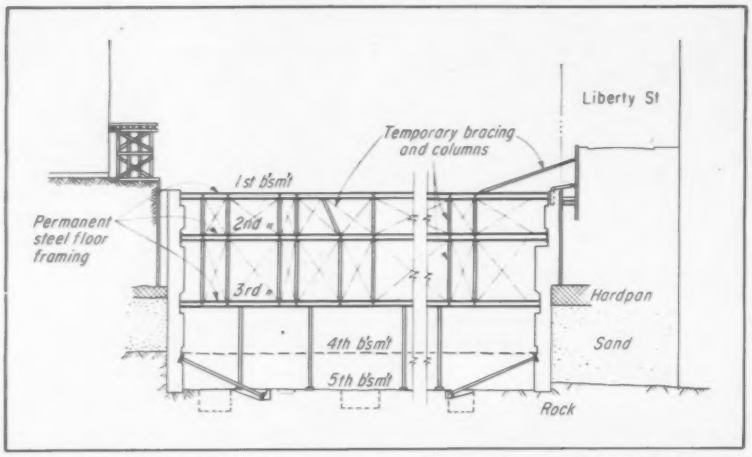
(*Story continued page* 36)



. . . Soil grouting takes pressure off foundation work



EAST-WEST SECTION during cofferdam construction. Subways crowding the ends of site required careful bracing during excavation.



NORTH-SOUTH SECTION with permanent framing down to the third basement level. Fourth level was erected later with columns running up to the first floor at street.

Four joint ventures submitted bids on the preliminary design. All included qualifications that led to rejection.

A large part of the bid costs and qualifications was due to labor costs involved in pneumatic work. Because of this, the work was rebid on a cost-plus-fixed-fee basis. At the same time, more studies were carried out on the possibility of using other methods to build the foundations at the end of the site where granular materials underlaid the hardpan.

• **Pneumatic work questioned**—In former years, it was the practice to use pneumatic caissons for deep exterior foundation walls in this area of the city. Careful construction by this method avoided soil loss and provided the quickest and surest means of construction. The foundation of the Federal Reserve Bank Building, by Moran, Proctor, Mueser & Rutledge, is typical of this type of design. So is the existing Chase Manhattan Bank Building at 18 Pine St.

Because of the high cost of pneumatic work, careful study was given to the possibility of completing the excavation in the open without compressed air. As a practical field check, a test pit was constructed where the bedrock was at its lowest elevation and the permeable stratum was thickest between the hardpan and bedrock.

Loss of ground in either the test pit or the ultimate construction of the large basement would have endangered the street and surrounding buildings, and also the subways close to the ends of the site. This was a particularly important consideration since excavation for the new foundations would be next to and extend below the subways.

The test pit was excavated inside steel sheetpiling driven to the top of the hardpan. An attempt was made to excavate through the hardpan down to rock using wood breastboards. This method had to be abandoned because of a heavy flow of water.

An attempt then was made to drive a second stage of steel sheetpiling through the hardpan while excavation went on below the leading edge of the sheeting. This succeeded, and excavation continued to some 10 ft above ledge rock. Work was stopped at this point because of heavy water flow, boulders, and the danger of losing the surrounding soil.

• **The answer: chemicals**—The engineers finally decided to try stabilizing the soil around the pit with chemical grout. Experimental grouting was done by the Soil Solidification Co. through 12 cased holes. Separate injections were made of sodium silicate and calcium chloride. This worked and the test pit was excavated to bedrock without any soil loss.

Plans then were made to grout all the deep granular material under the hardpan and to excavate the boxes in the open, as at the other end. All pneumatic work was eliminated.

• **Excavation in the open**—The foundation design called for heavy reinforced concrete walls constructed inside cofferdams around the entire site perimeter. Principal design considerations were water conditions and support of the walls against lateral movement both during construction and later. The solution involved construction procedure as well as design.

The final floor system must provide support for the foundation walls. Therefore, the walls were designed to span horizontally between wall braces to meet all construction conditions and vertically between basement floors in the completed building.

The exterior walls are sealed into bedrock as a cutoff against surrounding groundwater. In addition, a drainage system is provided under the lowest basement level to carry off seepage coming up through the rock. This gets around the need of designing the entire bottom slab to resist the 60 ft hydrostatic head in the area.

There is an interesting sidelight to the design of this bottom slab within the limits of the main vault. Here the slab on grade has additional reinforcing and is anchored by rock bolts to the bedrock beneath it. This slab, together with the walls and roof of the vault, will resist a head of water reaching all the way to street level. This protection is provided against the possibility of inundation and building damage due to catastrophe or wartime bombing.

The foundation construction procedure was developed by the consulting

10" (9#) Junior Beams are used in this two-story motel as second floor joists and as roof purlins. Second floor system and balcony will support a 40 pound per square foot live load.

"Unique cantilever design utilizes Junior Beams"

. . . says structural designer

Junior Beams play an integral part in unusual design of the new 210 unit South Gate Motor Hotel in Arlington, Virginia, one of the finest on the eastern coast. "We used Junior Beams in a cantilever design that placed the balcony floor at the same elevation as the second floor," reports Mr. George Fortune, of Fortune Engineering Associates, Alexandria, Virginia, the structural designer.

"This design eliminates steps from balcony into the units. The balcony is free of vertical supports," Mr. Fortune said. The three principal buildings utilize 170 tons of 10" (9#) Junior Beams, lightweight steel structurals made by Jones & Laughlin Steel Corporation. The Junior Beams are used as second floor joists and as roof purlins. Fabrication and erection was done by the Southern Iron Works, Springfield, Virginia.

Two flights of stairs at each end of the balcony provide easy access to second floor units. The stairs are fabricated of 10" and 12" Junior Channels, lightweight J&L hot rolled channel sections.

According to Mr. John C. Wright, owner-contractor, the design provides fireproof, attractive buildings at low costs.

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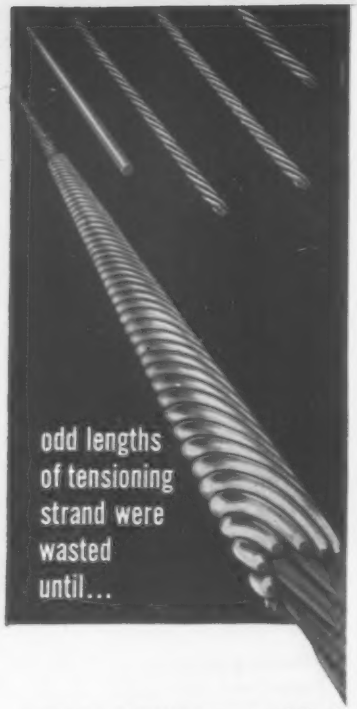

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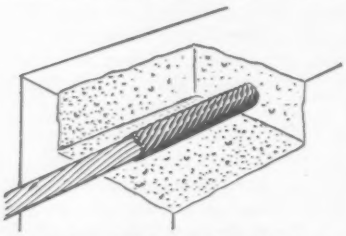

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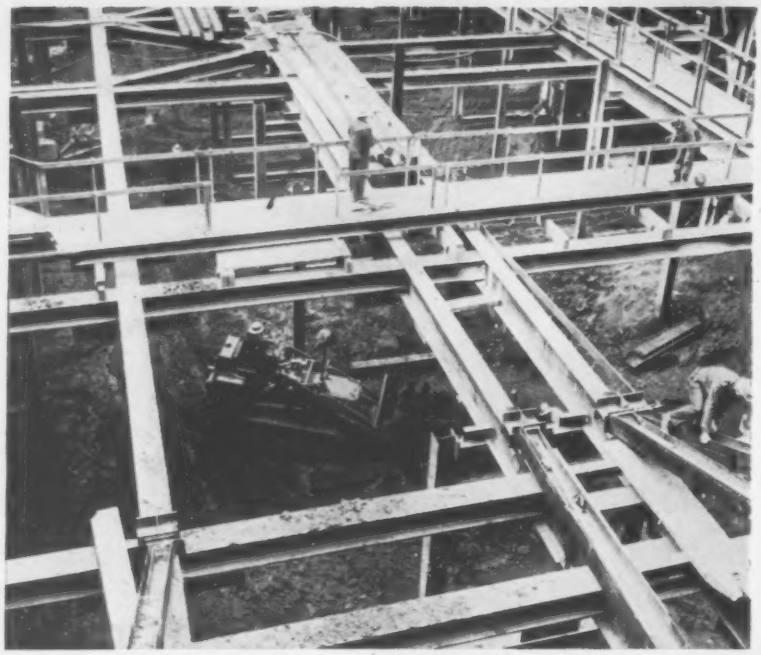
. . . Skyscraper frame has an added job in construction



DOUBLE-MEMBER FRAMING at the first basement level rested on steel piles while excavation went on below. Permanent columns went in later.

engineers and included in the bid drawings. It called for general excavation down through existing foundations to about 17 ft below the ground floor. Perimeter cofferdam construction was next. The substructure excavation and cross-lot bracing proceeded down in alternating stages.

The center of the site was excavated first, berms being left as needed around the perimeter. In the excavated area, spur braces to dead men were installed against H-piles driven along the property lines.

Next construction step involved driving two parallel lines of steel sheetpiling, 13 to 16 ft apart, around the perimeter. Diaphragm walls were inserted to break up space between the lines into 21 separate boxes.

Sheetpiles were driven from the 17 ft level down into hardpan. Driving 2 ft into the hardpan provided a firm seat and sealed out the upper level of water.

Alternate boxes were excavated, each box braced internally by steel struts and wales. In excavating through the hardpan and below, the cofferdam width was reduced to 10 ft from the 16 ft used above, and braced with steel beams.

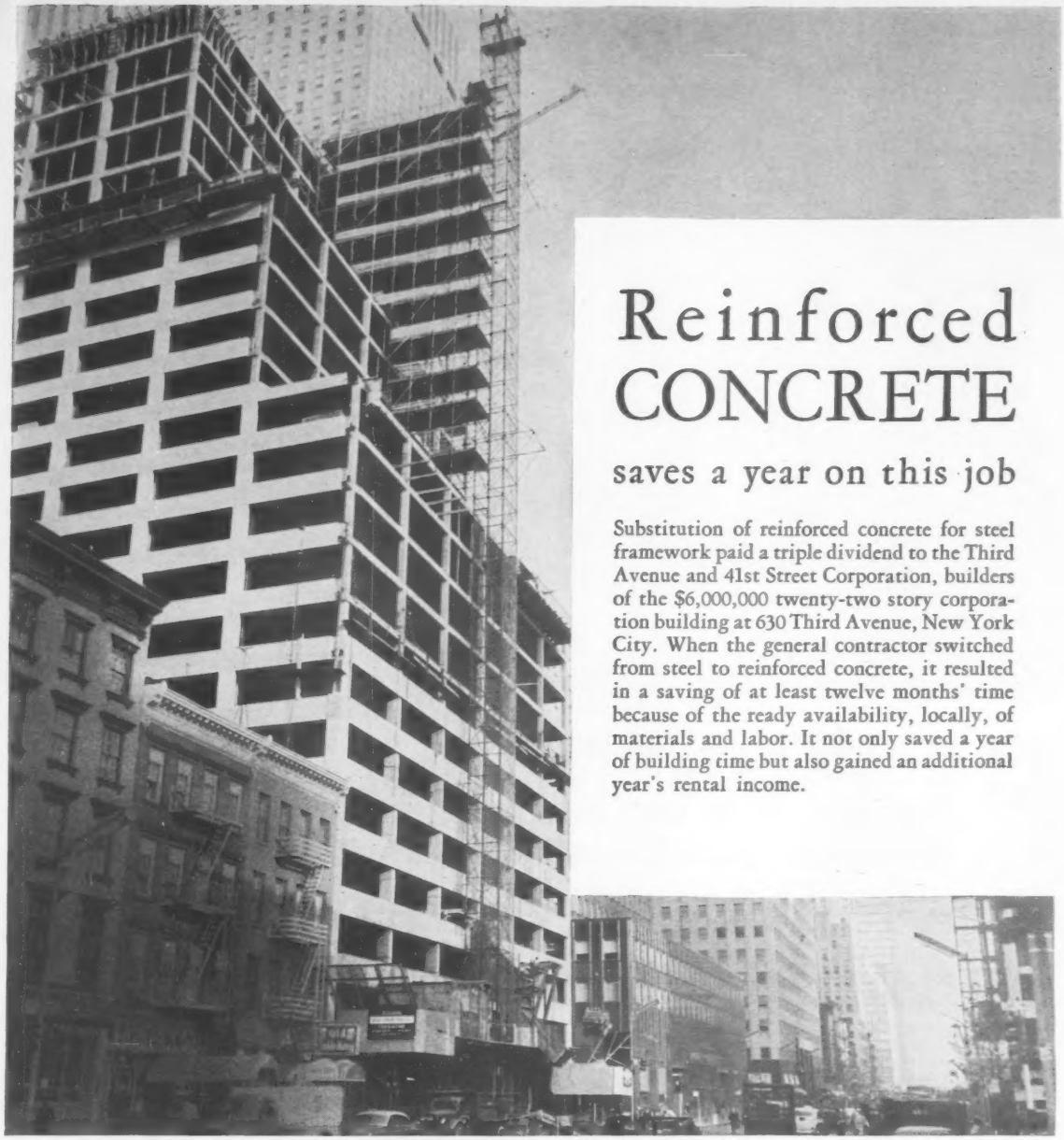
• **Soil stabilization**—Chemical grout was injected across an entire end and along sides of the site where silty sand was found between the hardpan and bedrock. Grouting was done through two lines of cased holes spaced 15 in. c-c. Drilling in this area was difficult because of heavy boulders and other obstructions in and below the hardpan strata.

As casings were pulled from each hole, the chemicals were injected into the soil in an attempt to make a solidified barrier on the outside of the exterior foundation walls.

Chemical penetration was a success—in the sandy materials and also in materials containing a greater amount of fines than it had been thought possible to treat. Stabilization of these soils between the hardpan and bedrock allowed excavation of the cofferdams here by the same method used where the hardpan rested directly on bedrock. The grouting was expensive, but it cut pumping costs and eased the problems of excavation.

At the ends of the site, where subways run just outside the property line, the excavation was stopped at the fourth basement level 64 ft below ground floor. Rock berms were left in place, and the excavation was stepped in toward the center of the site. This was done to minimize blasting close to the subways, which extended down only 27 to 35 ft below the ground floor.

• **Bracing serves two purposes**—Lateral support for deep foundation-wall construction usually is obtained by installing temporary cross-lot and spur bracing as excavation proceeds. Eventually



Reinforced CONCRETE

saves a year on this job

Substitution of reinforced concrete for steel framework paid a triple dividend to the Third Avenue and 41st Street Corporation, builders of the $6,000,000 twenty-two story corporation building at 630 Third Avenue, New York City. When the general contractor switched from steel to reinforced concrete, it resulted in a saving of at least twelve months' time because of the ready availability, locally, of materials and labor. It not only saved a year of building time but also gained an additional year's rental income.

Owners: Atlas Terminals, Inc., Arthur B. Belfer, and Belco Petroleum, Inc.—Renting and Managing Agents: Collins Tuttle & Company, Inc., New York City
Architects: Emery Roth & Son, New York City—Structural Engineer: James Ruderman, New York City
General Contractor: Diesel Construction Co., New York City

Reinforced Concrete Framework Speeds Construction

Using a high early strength cement and a precision schedule, the builders erected one floor every four days up to the fourteenth level. From that floor on, where the building narrows, the contractors completed the remaining eight stories at an average of one level every three days.

Pays Dividends in Additional Rentals . . . Moreover, the reinforced concrete 630 Third Avenue building was completed nearly twelve months ahead of estimated construction time for the same building with a steel framework. Because of the early completion date, the building management has been able to interest several desirable long-term tenants attracted by the prospect of early occupancy.

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...Skyscraper frame stressed

these supports must be replaced by permanent framing. Transfer of loads from one system to the other always involves risks of movement and damage. Lateral movement was minimized on the Chase Manhattan job by using the permanent floor framing as temporary and permanent support for the foundation walls. Each member of this framing system is composed of two parallel beams, about three to six feet apart.

The first-basement and lower levels of permanent framing were installed as the excavation proceeded. All levels were carried on temporary steel piles. Columns will be placed through the intersections of the double beam framing as part of the superstructure work, after excavation is completed.

The fourth-basement level, without heavy framing, is part slab-on-ground and part heavy slab over the bank vault. Walls at this level were supported temporarily by spur braces until the permanent slabs could be cast.

• **Prestressed framing**—Added stability was gained for the foundation walls by prestressing the permanent frame.

The basic concept of prestressed permanent floor framing for use as a temporary lateral support is simple. However, the use of jacking equipment and actual details of stressing are complex. The final stresses in individual members of the several framing systems are affected by temperature, elastic shortening, temporary lacing and other field conditions. Elastic shortening of 1.6 in. was anticipated in the 390 ft length of the building framing.

Prestressing was done with four 300 ton jacks on each end of each double member, worked from a single hand pump through a manifold. Jacks were loaded separately to provide the force required to align and prestress each member throughout its entire length. Sets of jacks and wedging were provided at each end to control and equalize elastic shortening during the main loading and offset friction at points of support.

Maintenance of close tolerance was required in all the permanent floor framing. This careful positioning will allow correct plumbing of columns when they are installed during superstructure construction.

Architect for the project is Skidmore, Owings & Merrill. Weiskopf & Pickworth is the structural engineer. The foundation engineer is Moran, Proctor, Mueser & Rutledge. The foundation contract with the owner is held by the joint venture of The Foundation Company, George M. Brewster & Son, Inc., and Joseph Miele Construction Co., Inc. Turner Construction Co. is the general contractor.

Largest Crane on Rubber Tires works on "Richest Hill in the World"

A 75-ton Lorain Moto-Crane is erecting 2048 tons of steel at Anaconda Copper's Berkley Pit Project near Butte, Montana, where three conveyers, totaling 2000 feet long, are being built to transfer ore from the open pit to loading bins.

It is on big jobs like this that the Lorain MC-875, the biggest rubber-tire crane, proves its worth. The massive Lorain-designed-and-built carrier has a frame of a single-piece, box-section, alloy steel casting designed to defy the deflections and torsional stresses of heavy-duty crane service.

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2-Lever, "Joy-Stick" air power controls are simpler, easier, faster — fewer motions, less operator fatigue.

The Square-Tubular-Chord Boom is stronger and lighter; it permits greater capacities, wider ranges, greater lengths.

Not every contractor can use a rubber-tire crane of this size, but where the demands are greatest, this is the crane for the job. Comparable outstanding performance and design advantages also are available in other Lorain sizes starting at 7 tons — on rubber tires or crawlers. See your Thew-Lorain Distributor for details.

This 75-ton Lorain Moto-Crane, model MC-875, has been on the job daily since June, 1957. Here are some of the jobs it has performed:

1. Unloaded 49-ton crusher jaws.
2. Erected 18-ton conveyor gallery spans, 106 ft. long.
3. In this picture, it's using a 120-ft. boom, plus a 30-ft. tip extension, to erect the 90-ft. high machine house. (This long-range D-3 boom is extensible to 200 ft., plus a 40-ft. tip extension.)
4. Has walked all over the job with a 120-ft. boom, including travel under telephone wires only 20 ft. high.

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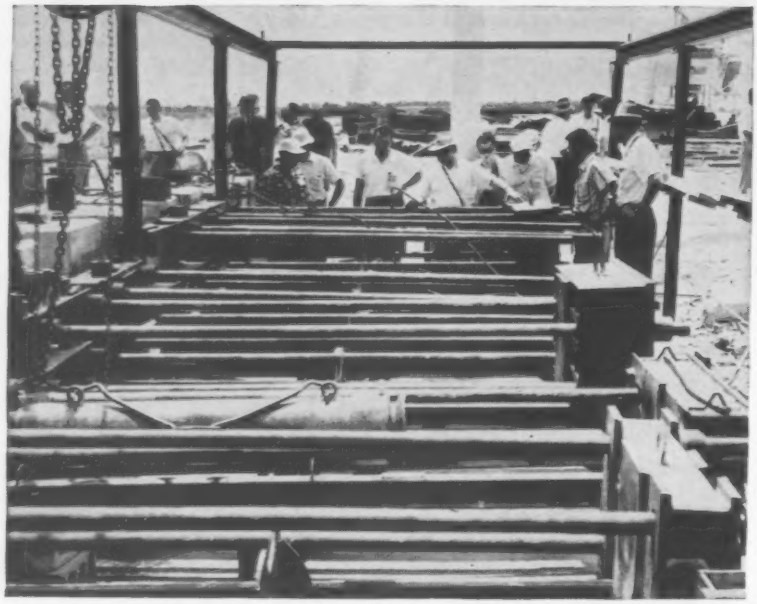
This Amazing Prestressed Concrete Industry



What Is Behind Its Phenomenal Growth?

This is a question which has been asked many times. Union Wire Rope Corporation has answered with the sound reasons for venturing a huge capital investment in expanded facilities and in research to master the technical know-how of producing prestressed, stress relieved, high tensile wire and strand. Without this key element prestressed concrete would still not be possible and practical.

To check our own reasons and to develop all of the fundamental facts responsible for the spreading use and acceptance of prestressed concrete,

We Asked A PANEL OF PIONEERS In the Prefabrication of Prestressed Concrete Members To Summarize the Facts Which Has Enabled Them To Maintain a Yearly Growth of 200 to 300 Percent.

What follows is straight from the horse's mouth. It is a summary of the fundamental facts contributed by a sizeable group of prestressed fabricators and consultants. All are pioneers who have had a part in the development of prestressed concrete and experienced its growth from a trickle five years ago to become the building material to be reckoned with by every factor in the building industry.

Here Is a List of Prestressed Products Which A PANEL OF PIONEERS Are Prefabricating

Girders

Roof Slabs
Regular, Lightweight, Lift, Channel, Thin shell, Hollow centers, Composite.

Beams
Joists
Trusses
Columns

Piles and Caps
Foundation, Marine, Fender

Lintels
Wall Panels
Siding
Posts

Pavements
Highway, Airport

Stadium
Framing, Seats

"Future Applications of Prestressed Concrete Beyond Prediction"

These are the words of one and the consensus of opinion of others on our panel of pioneers. Other prestressed concrete products mentioned as either being prefabricated or tested and proposed are:

Missile Wings	Arches
Barges	Skews
Transmission Line Supports	Spring Board—For Swimming Pools
Piers	Off-shore Drilling Piles
Seawalls	Platforms
Wharfs	

While some of these may seem novel, many will become commonplace. Prestressing concrete for barges, for example, could very well become an industry in itself as is the prefabricating of bridge members.

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PANEL OF PIONEER Prefabricators Cite These Outstanding Prestressed Concrete Advantages...

1. Fully Utilizes Two Inherent Strength Factors

Prestressing combines and enhances the inherent characteristics of two of the foremost construction materials—

A. The compression strength of concrete with
B. The high tensile strength of stress relieved cold drawn steel wire and strand.

2. Basic Economy

A. Steel for prestressing is six times stronger than ordinary steel but only approximately 3 times more costly.
B. Concrete for prestressing is twice as strong but only 10 to 20% more costly than ordinary concrete.
C. Prestressing consumes less steel and concrete to attain equal or greater structural strength more economically.

3. Structural Balance

A. In prestressed concrete, stresses and strains are balanced to produce structures whose deflections are under definite control.
B. Cracks, otherwise unavoidable in concrete, are eliminated by prestressing.

4. Design Economy

A. Prestressed concrete makes possible thinner sections, lower depth to span ratios, longer cantilevering without ballast beams and reduction in weight. All of these factors enable the designer to effect savings in foundation, in columns, in wall height or to convert head room into usable cubage.
B. Steady progress in standardization of sections under the auspices of the Prestressed Concrete Institute is making prestressed concrete more and more versatile from the standpoint of designers.

5. Prestressing Is Pre-Testing

A. Because they are subjected to greater loads in fabrication than is imposed upon them in the field, precast, prestressed members are in reality pretested.
B. Produced by factory methods, under closely controlled conditions, prestressed concrete guarantees the designer structural performance to meet or better expectations and affords relief from extensive supervision and inspections.

6. Stock Pile Availability

A. Factory line production methods with time saving devices insures delivery of prestressed concrete members from the production line in step with contractors work schedules.
B. Production of prestressed sections proceeds at top speed, affording maximum utilization of labor and stockpiling against projected construction.
C. Prestressed concrete eliminates construction delays by by-passing materials in short supply or on extended backlog delivery.

7. Speeds Up Construction

A. Construction by the older, conventional methods involves both erection and fabrication on the job site.
B. The latter is accomplished much faster in central plants or on the site mechanized plants and the resulting prefabricated units are erected with clocklike precision.
C. Often it is possible to complete structures in half the time required by conventional methods. It is often possible to erect prestressed concrete in the time required to make, place and shore up forms for poured in place concrete.

8. Permanence of Concrete—Plus

A. Well known is the durability of concrete. Well known too is its vulnerability to cracking. Cracks lay it and its reinforcing open to deterioration.
B. Prestressing makes concrete a flexible material with the ability to withstand extraordinary deflection and recover without cracking.

9. Insurance Savings

Comparison of insurance premiums are reported on new buildings with prestressed concrete roofs as against old buildings with wood roofs. Roughly the yearly premium on the latter is more than for 5 years on buildings with prestressed roofs. Though this is a comparison of extremes, it is indicative of how prestressed construction is regarded by insurance companies.

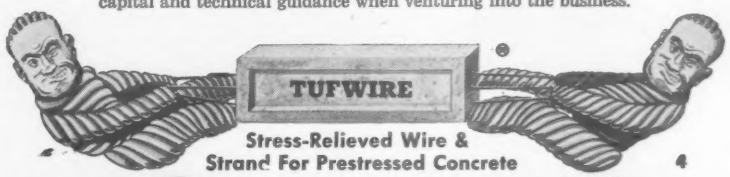
10. Economy of Maintenance

A. Even in marine construction or in construction subjected to other extreme corrosive conditions, the cost of maintenance on prestressed concrete construction ranges from nil to the expense involved in painting in cases where color is desired.

11. Widely Competitive

A. The initial cost of prestressed concrete is such as to enable its prefabricators to successfully bid against the permanent, fire resistant, all-weather types of construction in many types of structures.
B. When the collateral economies effected by prestressed concrete, such as greater and more flexible strength for longer spans and fewer columns, balanced stresses and strains and controlled deflection, thinner sections, lower depth to span ratios, lower wall heights and increased usable cubage, ready availability, speedier erection, negligible maintenance and lower insurance premiums are considered, then the competitive edge is definitely on the side of prestressed concrete for a growing list of structures.

So goes the summary of the thoughts of a panel of pioneers except for a warning which was sounded: Be sure of adequate capital and technical guidance when venturing into the business.



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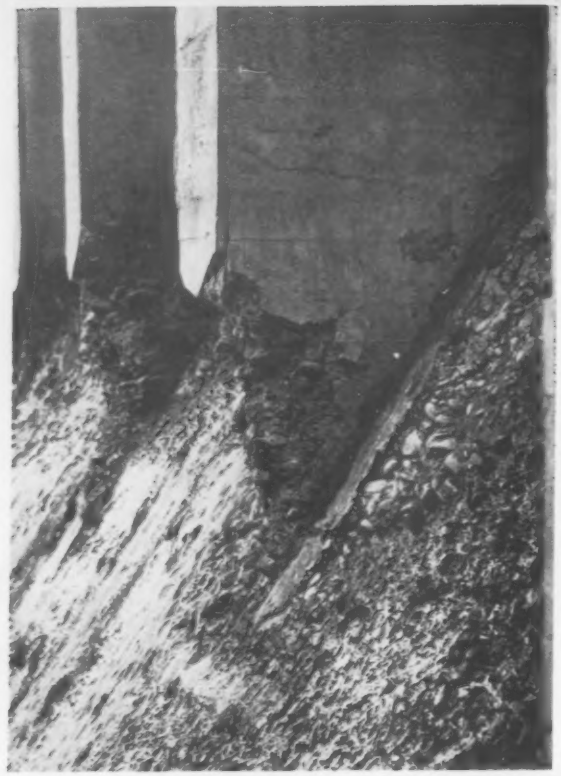

1 Old dam's rundown surface needs repair . . .

2 It starts with removal of concrete decomposed by ice and

40-Year-Old Dam Gets "Facial"

The integrity and good looks of 40-year-old Lake Creek Dam in Troy, Mont., have been restored by an unusually well executed job of grouting prepacked aggregate.

Much of the damage to both faces of the concrete structure was caused by lime deposits on the original face and to bruising formations of heavy ice lenses. Some of the tiers were entirely undermined by ice action, while loose and decomposed aggregate was washing away in many spots. Further investigation showed considerable leakage through deteriorated horizontal construction joints along the full length of the dam.

• **Tough specifications** – Consultant H. E. Bovay, Jr., of Spokane, Wash., decided that the thickness of new concrete to be placed on the downstream face of the dam was to be at least 8 in., which meant some portions would be 60 in. thick. Practically no concrete shrinkage was allowable, especially in the thinnest facing, and a dense, smooth and impervious surface was necessary.

The gravity type dam has a crest length of 265 ft and a maximum height of 40 ft. It has 6 ft piers along the crest and vertical lift gates between the piers.

Restoration started with chipping, cleaning and forming of the downstream face of the dam. Washed coarse aggregate—shipped from Spokane—was placed in the forms and thoroughly rodded to fill the forms and insure point-to-point contact. The downstream face then was grouted up to the base of the piers.

Along with the facing work, the piers were anchored and grouted. Vertical cores were drilled through the piers into the dam. The piers were stabilized, using long 2 in. dia rock bolts with large wedge-type expansion anchors at the ends. The bottom two-thirds of the bolts were grouted within the dam. Large, high strength structural steel washers were set as tightly as possible at the tops of the anchor bolts. The anchors then were grouted over their full length to the tops of the piers.

• **New pier needed** – Anchors were placed at the four corners in several of the piers. This proved adequate and permitted chipping around the face of the piers with safety. In one case it was necessary to remove and rebuild an entire pier.

While pier repairs were in progress, the reservoir level was lowered to expose the upstream face of the dam. As the pool dropped in height, the contractor followed with chipping and cleaning. In this way spillway crests, pier bases and a large part of the upstream face were ready for forming at about the same time.

Internal grouting from the upstream face was necessary to restore the deteriorated construction joints. This was completed before the dam was faced with new concrete.

Grouting of pre-placed aggregate in the dam crest and upstream face of the piers followed the joint sealing work. Reinforcing of the dam face was incorporated as normal temperature reinforcement and to resist tensile stresses in the concrete. Because of cold weather, some of the concreting was done beneath plastic sheet protection and with the aid of heaters.

When forms were stripped, fast action was necessary in pointing the holes

4 No

ENGIN

ice and lime . . .

3 Forms go up for grouted prepacked aggregate . . .

4 Now it looks like new—and no more leakage.

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. . . Dam gets facial

and removing blemishes so liquid membrane curing compound could be applied to the surface quickly within 12 hours.

After all other construction was completed, internal grouting on the south abutment proceeded. Voids and unexpected deteriorated horizontal joints were encountered, requiring more grouting than was expected. No evidence of premature sealing of grout orifices was found by the engineers, while grout pressures in the south abutment at times exceeded 100 psi.

When the tricky repair job was completed and the reservoir filled, engineers found no leakage through the face of the dam under full hydrostatic head. Originally, 80 or 90% closure of the cracks was expected. Shrinkage cracks were almost nil, with only a few minute cracks—probably the result of internal grout pressure along the repaired surface.

General contractor was Intrusion-Prepakt, Inc., Cleveland, represented on the job by W. G. Small and R. Carlson. W. N. Pauley was partner in charge for the engineer. J. W. Frisbee represented Montana Light and Power Co., which owns the dam.

California's Mammoth Pool Gets 1,100 Ft Head Turbine

The highest head Francis turbines in the U. S. have been given under contract to S. Morgan Smith Co. of York, Pa. They will be installed in the Mammoth Pool hydroelectric project of Southern California Edison Co.

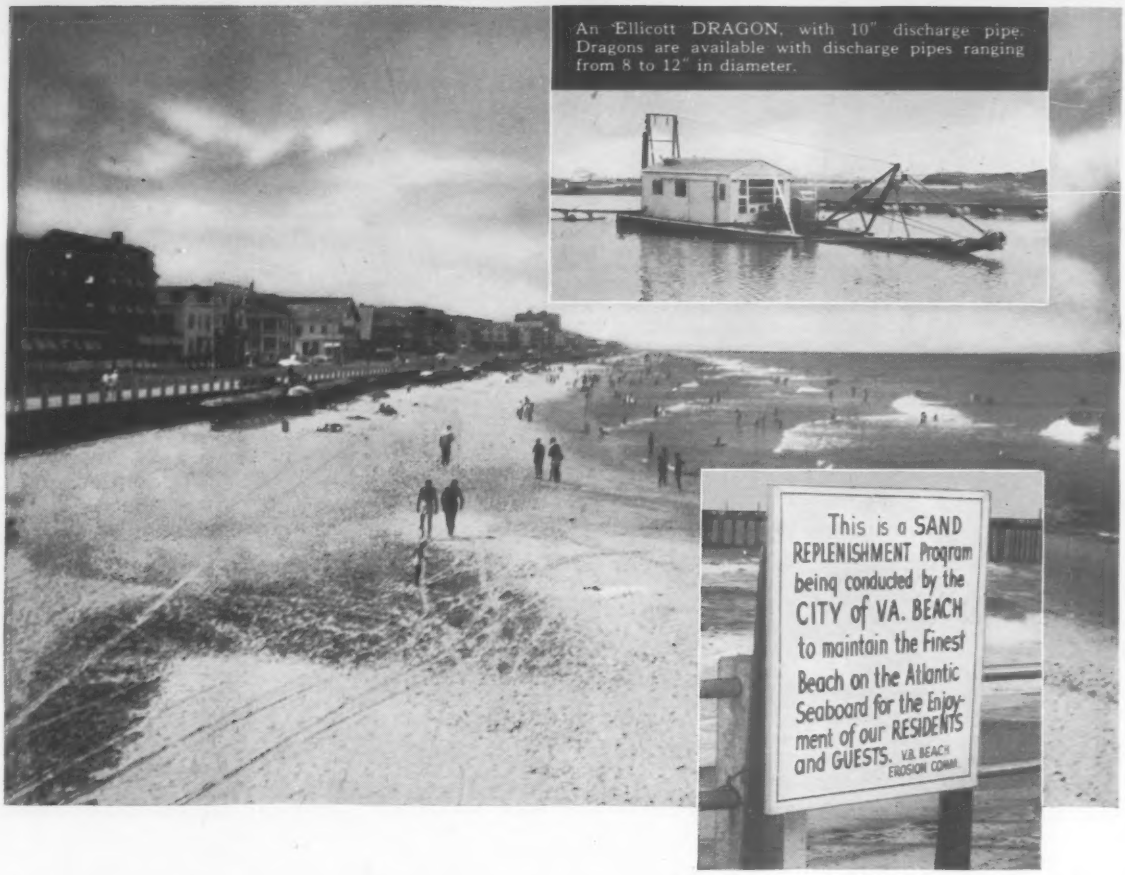
Maximum static head on the turbines is 1,110 ft, while maximum net operating head is 1,009 ft. Each of the reaction-type units is rated at 83,000 hp at a speed of 360 rpm under an average net head of 950 ft. The turbines are of the vertical shaft type, with shop-welded plate steel spiral cases.

Selection of Francis turbines instead of impulse units for this high head installation was made after considerable study and analysis.

The inlet valves at the turbines are of the butterfly type with a maximum 90 in. dia.

To prevent the occurrence of excessive water hammer in the penstocks during closure of the turbine wicket gates, each unit will have a pressure regulating valve to operate automatically to temporarily bypass the water flow. These will discharge directly into the tailrace.

The Mammoth Pool powerhouse site is on the upper San Joaquin River, 65 miles northeast of Fresno, Calif., at El 2,230. The dam and intake equipment is over 1,000 ft higher, in the Sierra-Nevada Mountains.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An Ellicott DRAGON Model hydraulic dredge is helping to win a 3½ year fight against sea erosion that once threatened a famous eastern beach resort.

In just one year, the dredge has reclaimed every critical beachfront area. Working five 8-hour days a week, the machine digs up clean fill sand, and delivers it where needed, through a 10" pipeline. Hydraulically pumped sand fill is practically self-grading.

Hydraulic dredging is the preferred method for reclamation of waterside lands. With *one* machine combining the three major jobs of digging, transporting, and grading, it is the most efficient way of moving waterbound earth solids. And the cheapest.

Ellicott DRAGONS make the advantages of hydraulic dredging available at minimum cost. Compact and completely portable, they can be moved almost anywhere—by water or overland.

Highway construction, flood control, and real estate development are other typical fields in which the versatile DRAGONS play an efficient, cost-cutting role. 1054

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Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

OWNER representative W. F. Timoney says, "This is the most economical system we could use to attain a structural floor with under-floor electrification. Placing of E/R Cofar is fast and economical. After the steel frame and stairs were erected, we put in Cofar and had an immediate work platform on every floor of the building. We'll consider this system in all our multi-story buildings. We *know* its good!

CONTRACTOR R. E. Dailey says, "We like the system because it makes our schedule predictable. We know exactly when we will pour. After we poured the second floor, we made a guess on when we'd 'top out' and how much the whole job would cost. Now we see we're going to meet *or beat* both estimates. It's never happened before! Although these products are new to every man on the job, there's hardly a thing we've had to do over."

COFAR ERECTOR W. DerVartanian of Reinforced Steel Erectors Corp., says, "Usually we place steel over wood forms but this job is much simpler. Cofar was delivered so fast, we didn't know where to put all the bundles. It places easily, makes a good work deck and all the sheets are well marked. You get a list of what each bundle contains. Sheets are uniform, too. Altogether, I'd say it was a real smooth operation!"

Wiring outlets needed everywhere! Bu
chooses E/R Cofar floor system. He

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Here's a job that *really* demands electrical flexibility! A new Detroit office building to be occupied by IBM®, itself! Four office floors covered with electrical equipment. Two "demonstration" floors where other machines are continually used, displayed, rearranged.

Difficult to electrify? Costly to install? Not with an E/R Cofar floor system! Heart of the system are two Granco products: Cofar steel units that serve as tight form for wet concrete and main positive reinforcement . . . E/R Cofar units, composed of wide steel troughs capped to form spacious raceways for electrical wiring, and also provide positive reinforcement. E/R units accommodate standard junction boxes and header ducts.

In the finished system, E/R and standard Cofar units work together to provide a reinforced and completely electrified concrete floor with ultimate strength of 7 to 10 times design load. No wood forms! No wasted fill! Construction is fast, easy, economical!

For more information, contact your local Granco distributor or mail coupon.

How reinforced concrete slab co

PLACING units is an easy 10-secon job! E/R Cofar span ranges up to 1 and 1-, 2- or 3-cell E/R units anticipa any future electrical needs. T-wir welded to corrugations provide te perature reinforcing, mechanical a chorage between concrete and ste

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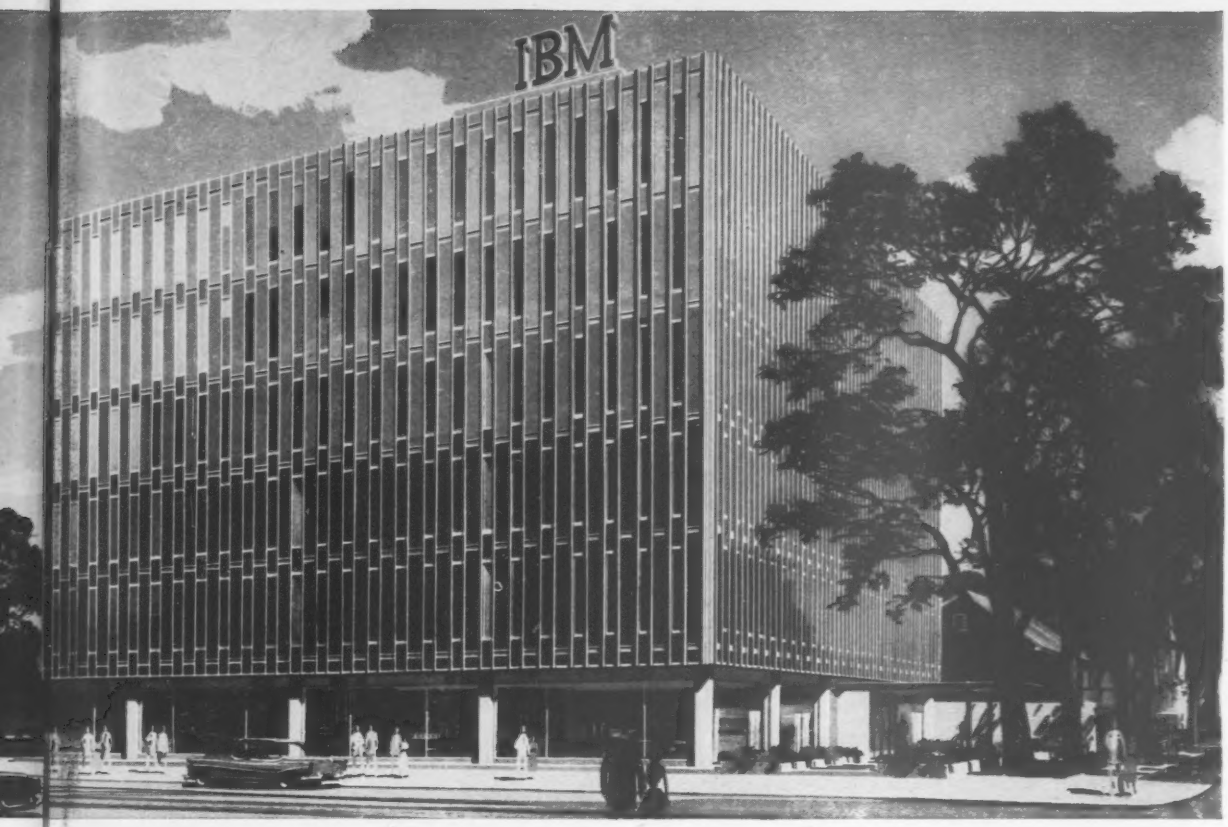

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crete slab construction is simplified when E/R Cofar is specified

WELDING Cofar and E/R units to framing provides an immediate, strong, safe work platform. No forms to build! Trades move in, days sooner! Wires pulled through E/R raceways can be brought to desks and business machines wherever they are located.

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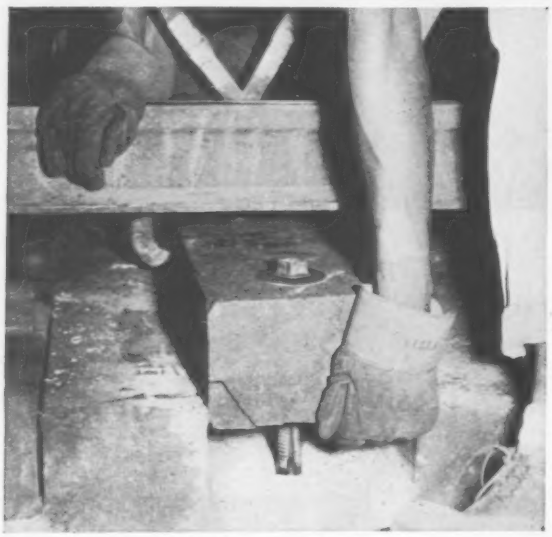
1 With tie removed from between concrete slabs, a 1 ⅜-in. diameter hole is started in sub-flooring.

2 Bethlehem Anchor Bolt is inserted into hole in tie. Washer under head prevents gouging.



3 Tie is placed beneath rail. Expansion shell on threaded portion of bolt drops into hole 4 ½-in. deep.

4 When bolt is tightened, leaves of expansion shell expand, locking wood tie to base concrete.

Special Bolts Anchor Wood Ties in New York Subway

Contraction of the ties and concrete around the ties created a serious maintenance problem in portions of the roadbed of the New York City subway system. Where tie replacements in this type track became necessary, anchorage proved difficult. Therefore the New York City Transit Authority decided to bolt the ties to the concrete sub-flooring by means of ¾-in. x 9-in. Bethlehem Anchor Bolts. The bolts, used with leaf-type expansion shells, were installed as shown in the photographs above.

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How to Be Sure of Treated Wood Piling

A. P. Richards
Director, William F. Clapp Laboratories
Duxbury, Mass.

The most widely used marine piling material—creosote treated wood—has been losing its market position to other materials in recent years. This probably is due in part to an increasing number of failures. Yet, along with the failures, there are many outstanding examples of the permanence and durability of treated wood

The big problem for designers of marine structures is getting high quality marine piles that have long life and need little maintenance. Treated wood can do the job. The question is how to be sure that it will.

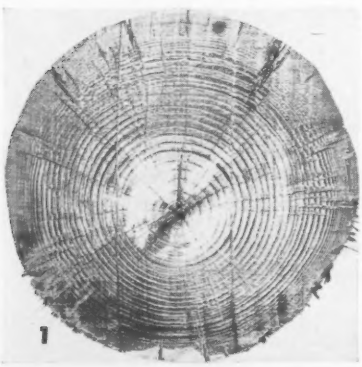
The answer lies in strict specifications for penetration and retention of preservatives, coupled with efficient inspection techniques. For while penetration can be determined visually, retention cannot. Even the most skilled inspector cannot look at borings taken from piles and estimate, with any degree of accuracy, the quantity of oil retained in the wood.

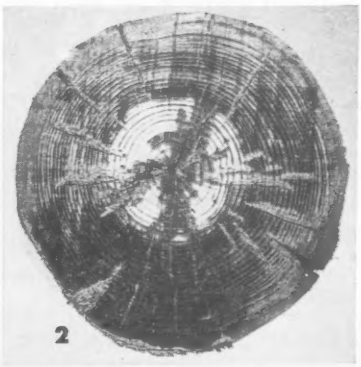
In fact, it is practically impossible for an inspector to determine whether a pile is treated with 12 lb or 20 lb of preservative (see picture below).

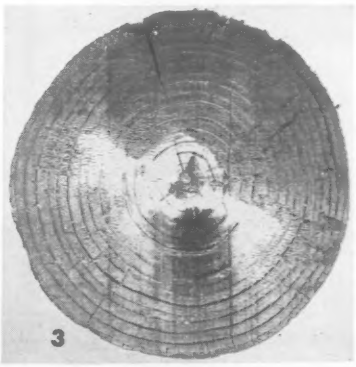
However, the requirements for good marine piles are simple. The white stock—that is, the raw, untreated pile—must be of suitable quality; the preservatives must be of proven value and unadulterated; the piles must be impregnated with an adequate quantity of preservative with a maximum penetration.

• **White stock**—Requirements for the basic material—the stick—are adequately covered in such documents as ASTM B 25-55. With these specifications as a guide, it is easy to check on the

Which Pile Got the Best Treatment? (Answers on next page)







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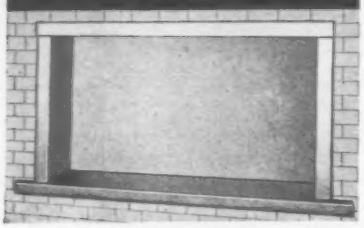

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See Sweet's Arch. File 34c/Pe, page 9.

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. . . Existing specifications are good but need changes

acceptability of butt and tip size, the size and soundness of knots, the straightness of the pile and its grain.

• **Preservatives**—Based on experience and research over the last 40 years, the William F. Clapp Laboratories recommend creosote coal tar solutions for use in all waters where borers are, or may become, a problem. These preservatives are covered by Federal Specifications TT-W-556c and AWPA P-2. But these specifications, while satisfactory for many applications, are not adequate for marine piling.

For example, even when there is danger of severe marine borer attack, the specifications permit the use of distillate creosote or low residue distillate in place of creosote coal tar solutions. And although the distillate is more expensive, it is a less permanent preservative. Tests have shown results are generally better with 70/30 creosote coal tar solutions where limnoria are involved.

Then, too, the specific gravity of fractions is not high enough to provide the protection needed, and present requirements permit some adulteration with less effective materials.

Therefore, the required specific gravities should be increased. For fractions now acceptable with specific gravities of not less than 1.025, the minimum should be raised to 1.030. Where specific gravities of not less than 1.085 are now acceptable, the minimum should be raised to 1.100. Analysis of the preservative always should be made at the treating plant. Preferably the sample should be taken directly from the cylinder as the charge is being pressure impregnated.

• **Pressure treatment**—In the final analysis, the durability of a marine pile depends primarily on two factors: the degree of penetration and the retention of preservative. The penetration should be uniform and complete, and the retention should be not less than 20 lb of preservative per cu ft of wood when southern yellow pine piles are used, and not less than 16 lb per cu ft for Douglas fir.

Inadequate penetration or insufficient retention of preservative will leave a marine pile wide open to attack by both limnoria tripunctata and teredo, and failure will follow. Even in the absence of borers, the inadequately treated pile will soon need replacement because of the deterioration that will take place above the water line.

Specifications most commonly used for the treating of marine piles are AWPA-C-3 and Federal Specifications TT-W-571c. In general they are satisfactory. But they should also require rejections of all piling in any given charge if more than 10% of the piles have inadequate penetration. This suggestion will bring howls of protest from plant operators. But it must come, or markets for wood piling will be lost. Tests show that when rejections for improper penetration exceed 10%, many of the accepted piles would be rejected if second borings were made at 90 deg from the first borings.

A second weakness in the present specifications lies in the laxity in enforcing branding requirements. Piles should show, 5 ft and 10 ft from the butt, the name of the treating company, the year of treatment, the preservative used and the retention.

The most glaring deficiency, however, is the poor procedure recommended for determining the preservative retention. Now an inspector does this by taking inventory of the preservative in the work tank before the start of treatment, and by subtracting from this the amount left after completion of treatment.

But the inspector is required to perform many other functions while supposedly keeping track of the amount of preservative used. These functions include inspection of white stock, analysis of preservative and observation of the treating cycles (which run 18 to 24 hours—and longer on Douglas fir). Fur-

Which Pile Got the Best Treatment?

(See pictures on p 51)

1. **Best of the three.** **Oil penetration is uniform and into heartwood. In spite of light color of wood, retention was assayed at 20 lb.**

2. **Looks good but . . .** **in spite of oil penetration into heartwood and dark color, this pile retained only 12 lb of oil per cu ft.**

3. **Not good.** **Propeller-shaped white section shows poor penetration. But it took an assay test to show retention was under 12 lb.**

All of which shows you can't tell by looking. For full details on how to make sure of treated wood piling, read the accompanying story.

(Photos courtesy of The Koppers Co.)

. . . Testing is important

thermore, a check on the detailed operations of the man treating the charge is next to impossible because of the complexity of plant piping systems.

• **Testing methods**—The deficiency in specifications has been recognized for some years. Because of this, the Forest Products Laboratory at Madison, Wis., along with other interested groups in the treating industry, has developed a non-destructive "assay" method for determining the retention of treated wood. Recent tests indicate the assay method will show retention to within plus or minus 1 lb per cu ft if twenty 3 in. borings are extracted from each charge of piling. Thus, both the contractor who purchases piles and the owner who will ultimately pay for them now have an added control over the materials to be incorporated in a job. And the control covers not only quality of materials but also cost.

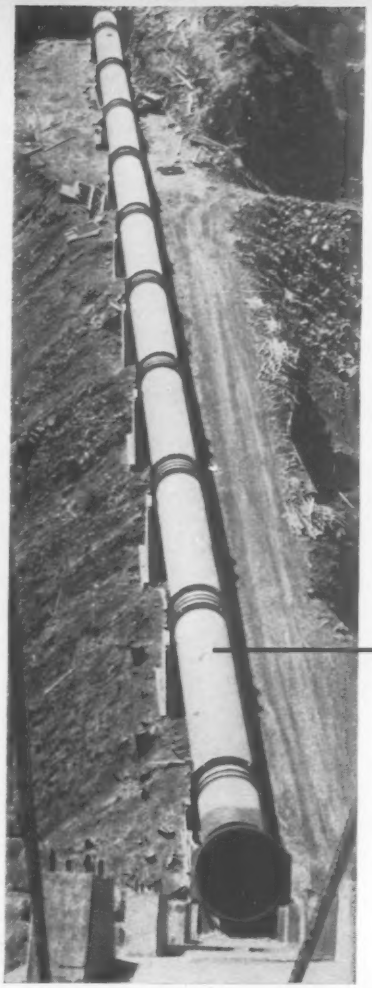
For example, the cost of a 20 lb treatment for a 12 in. butt, 40 ft pile would be, for oil alone, approximately $14 or 35 cents per lin ft. If the same pile is treated to only 12 lb, the cost of the preservative alone drops to 25 cents per lin ft—for a saving of $5.60 per pile.

Moreover, the difference in preservative retentions means reduced freight charges, too. The differenc betwen 20 lb and 12 lb treatment for a 40 ft pile is 200 lb. Depending on destination, the freight differential from southern supply areas would be from 1 cent to 5 cents per lin ft. However, these reduced costs are not savings to an owner, who eventually will pay far more than that amount for maintenance.

It seems logical, therefore, that a purchaser of treated piling should be able to determine the preservative retention of the piling he buys. The assay method permits him to do just that.

However, there is another side to the coin. Since the service life of treated piling is materially increased as the retentions are increased, it would seem practical for the purchaser to pay the supplier for retentions shown by the assay method as being above those specified. Through contract documents, the charge for extra retention should be passed on back to the owner, who will be the true beneficiary. The added costs cannot mean many dollars, but it can reflect many added years of service in a structure.

Then, with improved specifications, adequate inspection, and equitable distribution of costs, buyers can purchase piling on a competitive bid basis—confident that they are getting top quality materials for every job regardless of who treats the wood.



Each Dresser Coupling is engineered to meet the pressure at each portion of the penstock

CALIFORNIA-OREGON POWER COMPANY... another 100% Dresser-Coupled penstock

Near Yamsay, Oregon, you'll find another impressive argument for using steel-pipe penstocks and Dresser Couplings. The line is 100 percent Dresser-Coupled... the only type of joint which could be individually tailored to the pressure requirements at each portion of the penstock.

Up to 25% lighter

The Dresser method saves money by permitting the use of lighter wall, high tensile steel pipe. Weight savings can amount to 25 percent... resulting in lower freight and handling costs, lighter equipment on the job. There are no fussy lining-up operations. The flexibility of the Dresser Coupling compensates for slight misalignments caused by grade variations. With the Dresser method, you get a stress-free line, bottle-tight for life.

If you'd like to see technical data on a number of other Dresser-Coupled penstock installations, write for illustrated brochure. Before you draw up specifications, make sure you have all the facts on steel pipe joined with Dresser Couplings.

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Chicago
Houston
New York
Philadelphia
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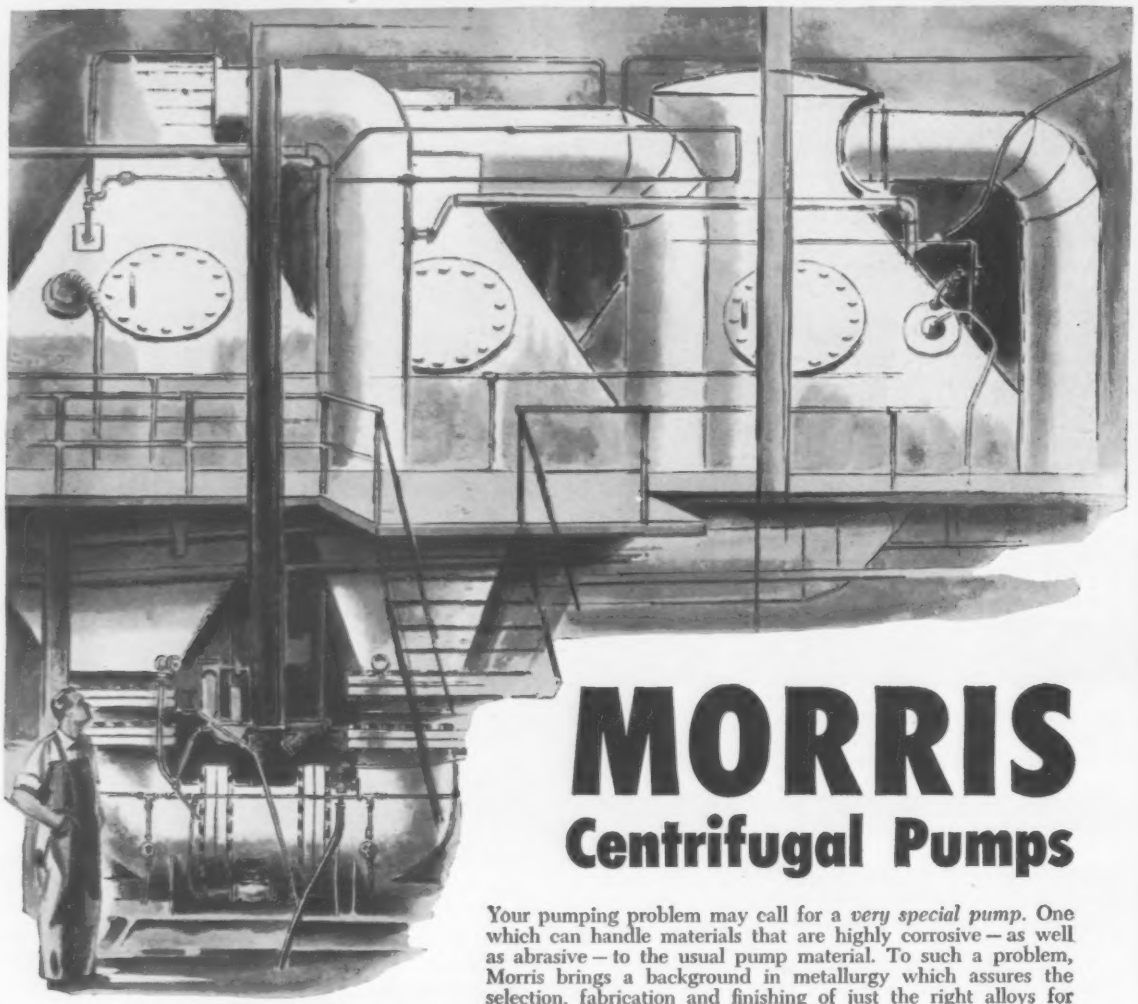
DRESSER MANUFACTURING DIVISION

ONE OF THE DRESSER INDUSTRIES

For pumping abrasive and corrosive materials



Two Morris 20" stainless steel pumps have each moved 12,000 gal/min of salt slurry since 1940. In 1955, two 24" Morris pumps of the same type increased circulating output by 14,000 gal/min each.

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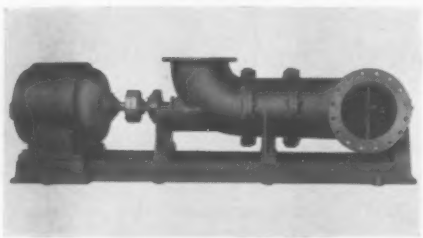
Centrifugal Pumps

Your pumping problem may call for a *very special pump.* One which can handle materials that are highly corrosive — as well as abrasive — to the usual pump material. To such a problem, Morris brings a background in metallurgy which assures the selection, fabrication and finishing of just the right alloys for your application.

CASE HISTORY: In 1940, International Salt Company installed two Morris stainless steel axial flow pumps to circulate salt slurry through evaporators at 200° F. Both ran *without pause* from the day they were installed until recently, when only minor repairs were required to return them to all-new condition. On the basis of this performance, when it was decided to up plant capacity, International chose two more Morris pumps of the same type.

Continuing high efficiency — even under adverse conditions — is the big dividend delivered by Morris.

If top performance *must* be maintained over long periods under adverse conditions . . . talk with our engineers. They are qualified to recommend a pump with a margin for safety you can depend on through the years.



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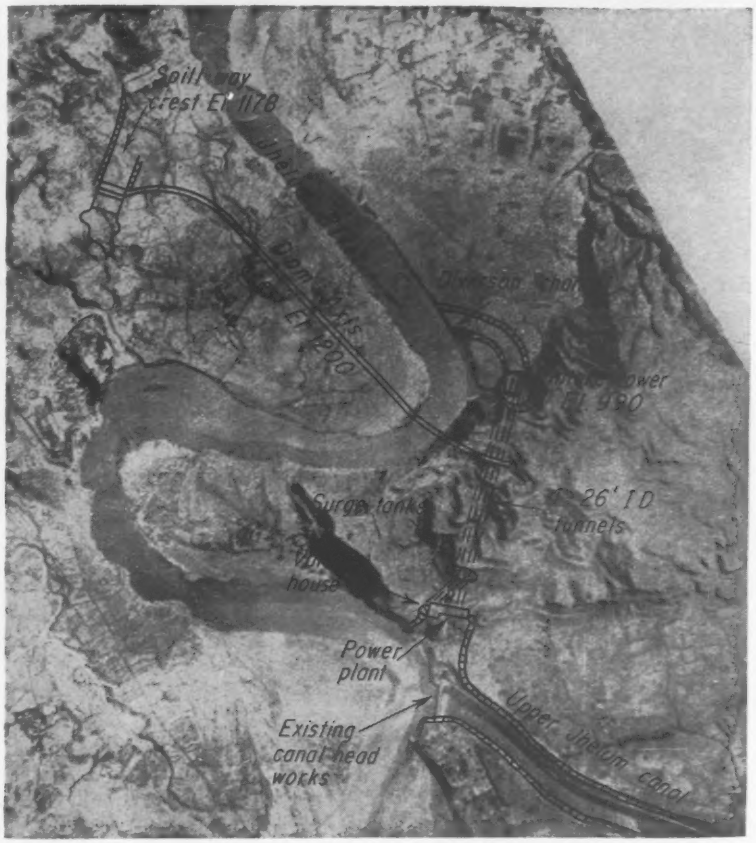


Pakistan Starts Huge Earth Dam

Pakistan has started construction of a $200 million earthfill dam near Mangla, on the Jhelum River in West Pakistan. The dam, huge by any standard, will be a rolled earth embankment of 53 million cu yd.

The dam will control discharges of the Jhelum for power and irrigation. With a drainage area of 13,000 sq mi extending into the Himalaya range, the river has a disproportionately higher summer flow because of snow melt and monsoon rains. Average flow varies from 5,000 cfs in winter to over 100,000 cfs in summer. Its annual average discharge is 23 million acre-ft.

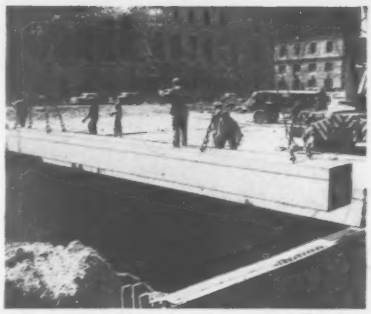
The powerhouse on the dam's left flank will have an installed capacity of 300,000 kw. Each of four 75,000 kw units will be served by a 26 ft dia tunnel. The spillway on the right will have 38 ft high radical gates and an effective width of 800 ft to pass a design flood of 100,000 cfs.

The dam will have a crest length of 9,000 ft and will be 365 ft high. Its effective storage capacity will be 3.5 million acre-ft. More than 3 million acres will be irrigated. Irrigation supplies passing through the powerhouse will be enough to meet a firm load of 200,000 kw.

The main dam will have five zones, the central one serving as the impervious core. The selected earth portion will be surrounded by filter zones of river run sand and gravel. On the upstream side, the filter zone will slope, but downstream of the core it will be vertical and of uniform thickness. Upstream face will be placed on a 2.5:1 slope.

The dam is expected to be completed in eight years. Abdul Hamid, of Pakistan, is chief of the project. Tipton & Hill, Inc., Los Angeles, prepared the feasibility report. Harza Engineering Co., Chicago, and Binnie, Deacon & Gourley, London, have been engaged to prepare final design and to supervise construction.

(*International continued on page 56*)

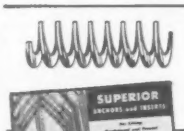


PRESTRESSED BEAMS QUICKLY POSITIONED

SUPERIOR Inserts and Eye Bolts Permit Efficient Handling

Prestressed beams, with SUPERIOR Screw Anchor Inserts and Eye Bolts for lifting, were used on the Vine Street Extension in Philadelphia, Pa. Beams were cast in the Lipsett, Inc. yard in Philadelphia and trucked to site. John A. Roebling's Sons Corp. cable was used for the prestressing operation.

On any prestressed or precast job as well as tilt-up panels or structural members, you can be assured of safety and reduced overall costs with SUPERIOR Accessories. Our experienced engineering staff is available to prepare estimates and layouts.



Superior 1¼" Screw Anchor Insert and Eye Bolt

WRITE for Precast and Prestressed Accessories BULLETIN PR-1

SUPERIOR Concrete Accessories, Inc.
9301 King St., Franklin Pk., Ill.

- NY Office—1775 Broadway, NY 19, NY.
- Pacific Coast Plant—2100 Williams St., San Leandro, Cal.
- Houston Office—4101 San Jacinto, Houston 4, Tex.

Above photos courtesy of John A. Roebling's Sons Corp.

Permalite insulating concrete (1:6 mix Portland cement and Permalite expanded perlite aggregate), 2" thick, weighs only 4½ lbs./sq. ft.—about 4 lbs. less than other commonly-used poured-in-place roof deck materials.

With such light weight you can usually specify a size smaller joist, weighing 2 lbs. less per lineal foot... 50¢ a foot saving, with a steel-in-place cost of 25¢ lb. And you have more than adequate compressive strength—180 psi.

As for insulation, 1:6 mix Permalite concrete has a "k" of 0.58, and a "U" value of about .20 for a 2" thickness with built-up roof over permanent forms such as corrugated steel and paper-backed wire mesh.

Other advantages: Firesafe. Can't rot. Vermin-proof; termite-proof. Handles and places like any ordinary concrete. Easily sloped to drain.

No other roof deck material gives you so much insulation, with so much strength, at such light weight!

See your Sweets File, or write for complete information

Permalite® | THE LARGEST SELLING PERLITE AGGREGATE IN THE WORLD

Perlite Department, Great Lakes Carbon Corp., 612 S. Flower St., Los Angeles 17, Calif.

Permalite aggregate is produced by licensed franchisees from perlite ore mined by Great Lakes Carbon Corporation.

. . . International

Japan to Build Railroad For 100 MPH Train Trips

Japan's Ministry of Transportation has announced plans to build a $223.3 million standard gage trunkline railroad between two of its major cities—Tokyo and Osaka. And it expects to do the job in such a way that trains on the route will get passengers from one city to the other in the same over-all time as an airline now servicing the two cities.

On completion of the project in 1964, it is expected that high-speed trains will cover the 311 miles between Tokyo and Osaka in three hours. The Japan Airlines now flies from Tokyo to Osaka in two hours, but travel time from city to airports requires more than an hour.

At present there is a narrow gage railroad between the two cities, but according to experts this will be too heavily traveled within the next five years to meet transportation needs of the area.

The Japan National Railways, a semi-government corporation, will provide $83.3 million of the construction funds needed. For the balance it expects a 6% government loan of $140 million redeemable in 15 years after completion of construction.

Indian Cities Get Loans For Port Improvements

Calcutta and Madras, two of India's largest and most important cities, have been given loans by the World Bank totaling $43 million for port improvements. Of this, $29 million will go to Calcutta and $14 million to Madras.

The Bank of America, Chase Manhattan Bank and Irving Trust Co. are participating in the two loans for a total amount of $1,705,000.

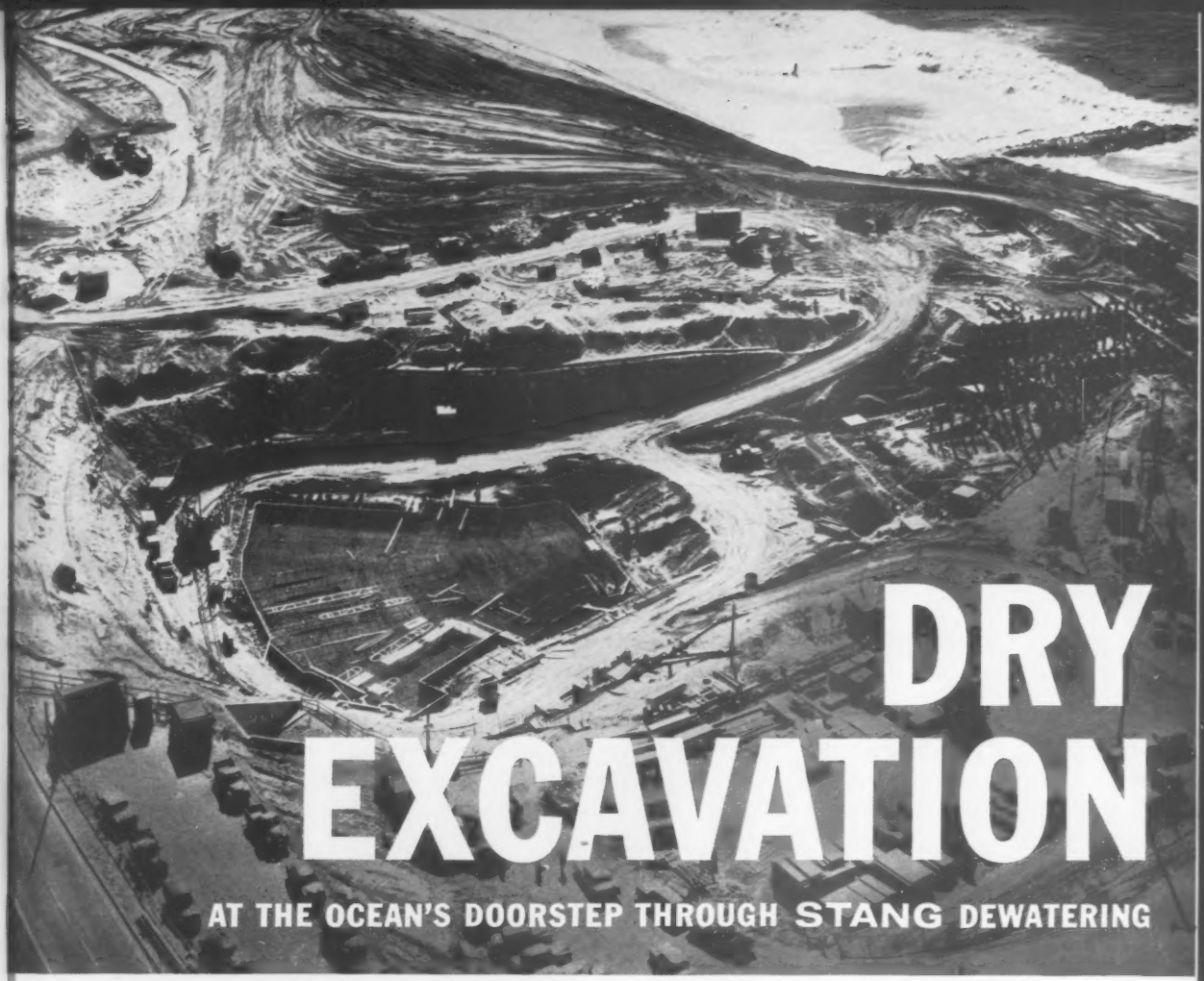
The loans are for a period of 20 years and will bear interest at 5½%.

French Utility Announces 150,000 Kw Atom Plant

The government-owned public utility Electricite De France plans to build a 150,000 kw nuclear power plant in the Ardennes, near the Franco-Belgian border.

A site has been selected on the Meuse River, and funds have been allocated for preliminary studies. The utility firm expects to have 850,000 kw of nuclear generating capacity by 1965.

Electricite de France already has two reactors totaling 160,000 kw under construction at Chinon in the Loire Valley. Another 50,000 kw generating facilities are being built along with the plutonium manufacturing plant at Marcoule in southern France.



DRY EXCAVATION

AT THE OCEAN'S DOORSTEP THROUGH STANG DEWATERING

H. C. Smith, contractor, says:

"STANG's expert engineering, instantaneous service and know-how KEPT OUR JOB DRY."

"We've used Stang on many jobs, and the thing that always impresses us most is the speed of service. Saturdays, weekends, day or night, when we call them, they're here. Besides the service, we depend on their engineering. Because they're experts in handling water, they invariably save us time and money.

On this particular job, we encountered several unusual and difficult water handling problems but, thanks to Stang's engineering and know-how, we kept out of any real trouble. In our book, Stang is tops."

For the most practical and economical answer to your water handling problems, call on water handling specialists . . . call STANG!

PICTURED ABOVE: The Scattergood Steam Plant, in Southern California, on the edge of the Pacific Ocean. The excavation, made in beach sand, measured approximately 300′ x 100′ at sub-grade, with a maximum cut in the deep section of 32′ below the water table.

Putting water in its place

STANG ...anyplace!

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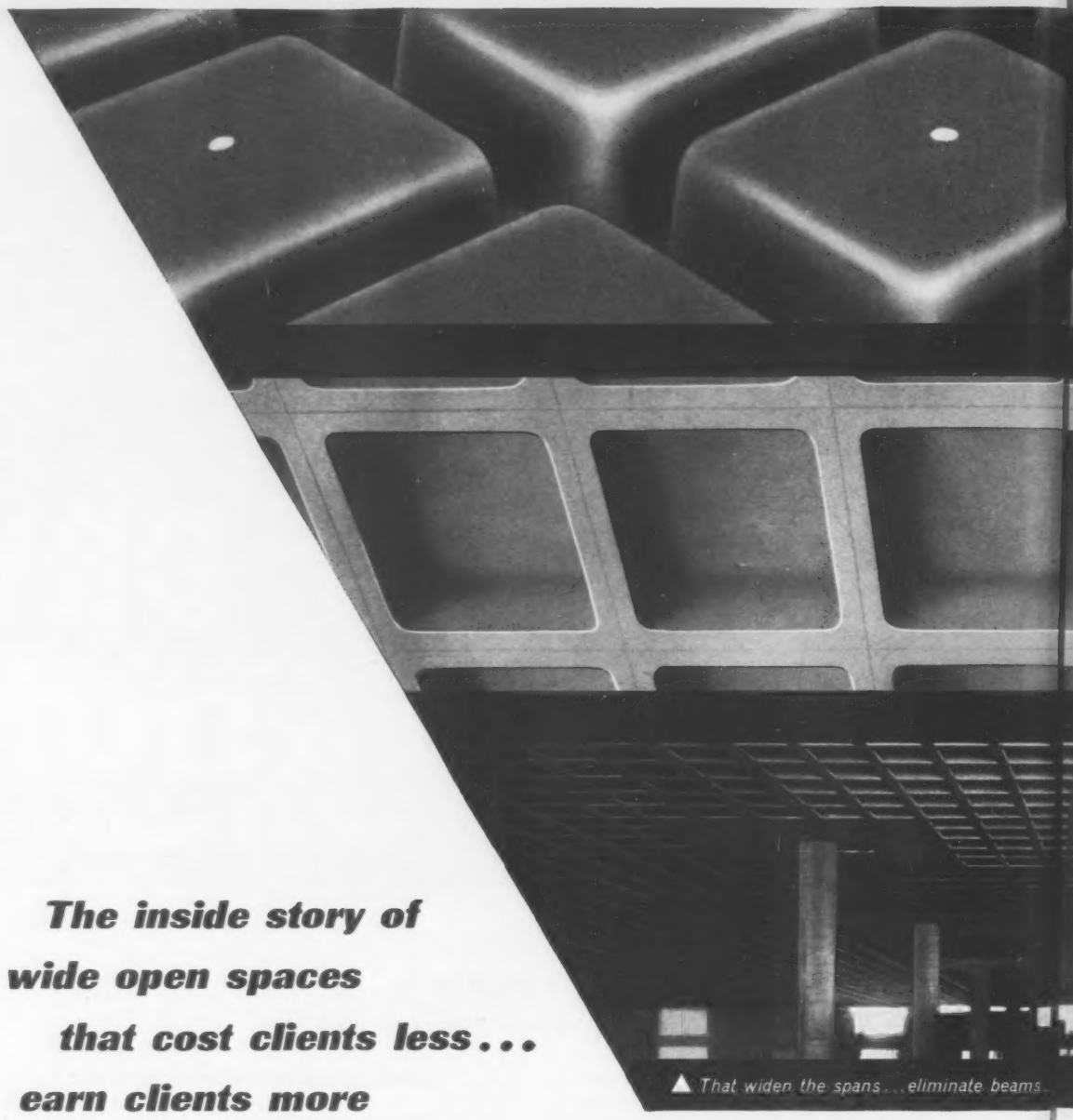

▲ That widen the spans . . . eliminate beams . . . and kee

The inside story of wide open spaces that cost clients less . . . earn clients more

Ceco Steeldomes provide flexibility to meet span and load requirements. Available in four depths: 8", 10", 12" and 14".

CECO'S ONE-PIECE STEELDOMES TELL THE TALE . . . Architects and engineers are always seeking ways to span wider areas at lower costs . . . to design buildings that offer the highest return to the client. Ceco offers a solution: Two-way dome construction, using one-piece Steeldomes. Result: Fewer columns . . . uniform ceiling heights . . . no flared heads . . . no drop panels . . . more unobstructed areas for owners to use. The spans are expansive—but not expensive.

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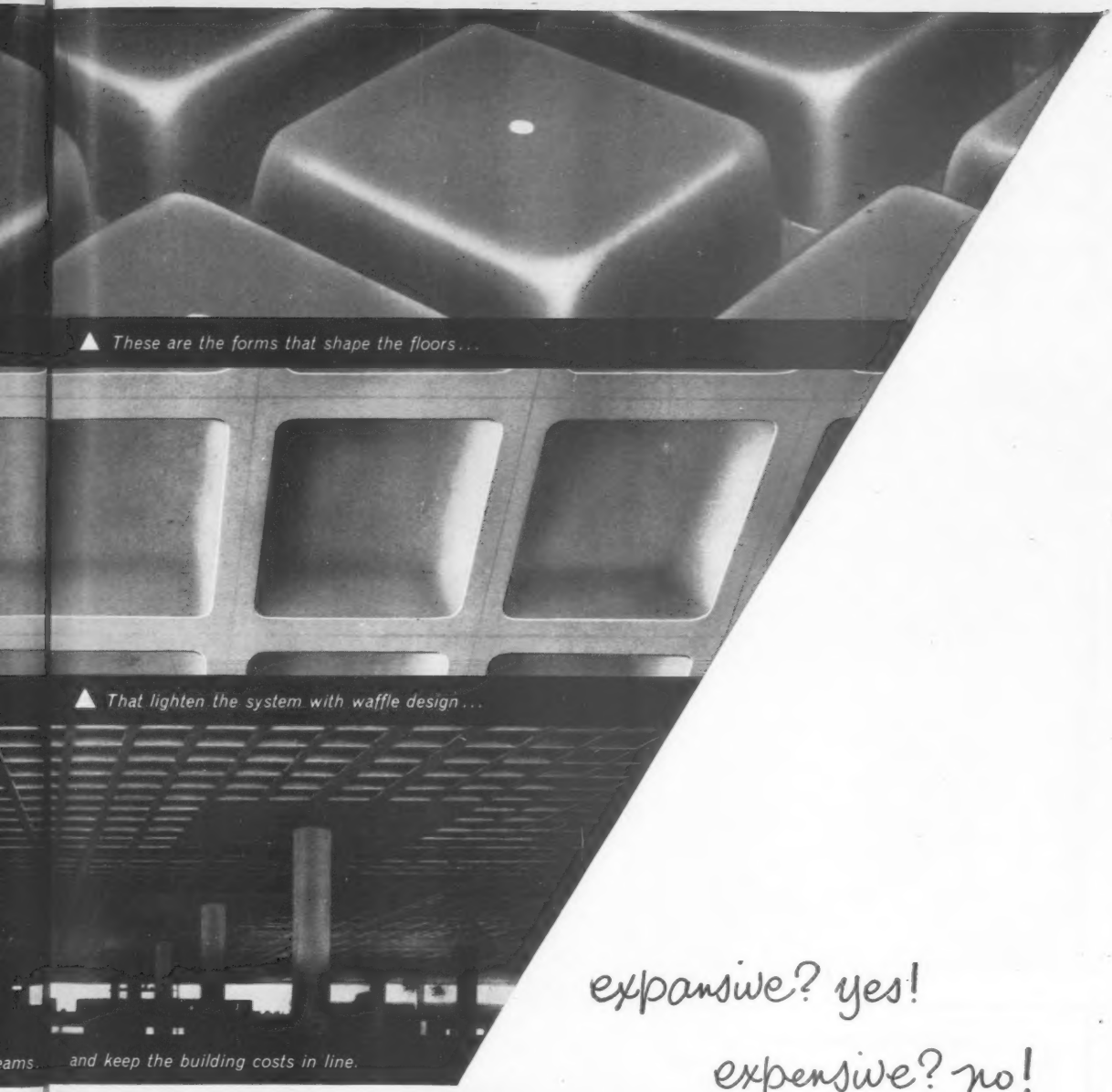

▲ *These are the forms that shape the floors...*

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...ams... and keep the building costs in line.

Savings in material and time are assured by the two-way design. And there is no higher quality concrete finish than provided by Ceco Steeldomes removed by compressed air. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

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New from Gardner-Denver
CV-25...CV-30...concrete vibrators

- **High frequency**
- **Long-wearing stellite tip**
- **Positive, automatic lubrication**
- **Low air consumption**

Here are two new high-frequency, one-man vibrators with plenty of power for fast penetration and compaction. The Gardner-Denver CV-30 is a heavy-duty vibrator that works best in concrete below 5″ slump. It's designed for large-sized walls and pillars, heavy floors, foundation and roof construction work. The CV-25 is a handy tool for precasting concrete products and working medium-sized walls and pillars. Both models have proved outstanding in performance . . . maintenance costs and down time are almost nonexistent. Compaction rate is limited only by the efficiency of the operator.

Check these Gardner-Denver features

Air motor power—a rugged Gardner-Denver rotary-vane air motor in the tube casing provides high-frequency power. There are no flexible shafts.

Flexible coupling — a bonded rubber coupling between air motor and unbalanced rotor eliminates shock loads between rotating parts.

Big, heavy-duty, radial ball-bearings—these bearings at both ends of the unbalanced rotor carry rotating loads with high efficiency and facilitate proper vibrator assembly.

Carburized and hardened case—resists outside wear. Tip is covered with a long-wearing stellite material.

Positive lubrication — The Gardner-Denver LO-12 line oiler is provided as part of the complete unit. Vibrator automatically shuts off if proper lubrication is not maintained.

Condensed specifications

Model	CV-25	CV-30
Tube diameter	2½″	3″
Tube length	17¾″	21⅝″
Weight	29 lb.	51 lb.
Vibrations per minute at 80 psi.	9000	8500
Air consumption at 80 psi.	34 cfm.	48 cfm.
Type of concrete (slump in inches)	Over 3″	Under 3″
Hose length between vibrator and throttle	8′	10′

Write for complete details

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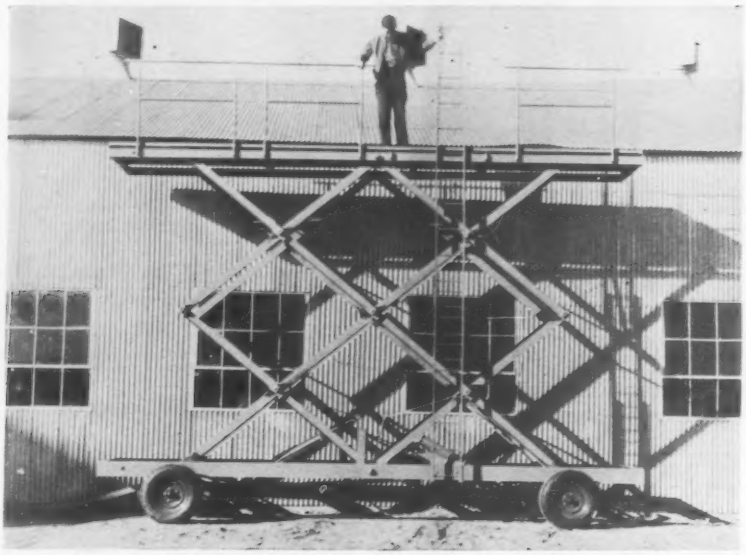
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



Rolling Scaffold Elevates to Suit the Job

A hydraulic system raises and lowers a new scaffold platform supported on an expanding scissors frame. Available in a variety of sizes and models, the "Sky Witch" scaffold is offered for truck mounting and in trailer-mounted and caster-base assemblies.

Capacities range from 750 to 2,000 lb, and up to 5,000 lb on special order. Standard models elevate from 10 to 17 ft and the specials up to 35 ft. Hydraulic lift power may be by 110 volt motor, 12 volt motor for operation off a truck generator, or by a 2¾ hp gasoline engine. CHARLES MACHINE WORKS, 640 PERRY ST., PERRY, OKLA.

Quick Field Conversion for Hoe-Shovel

An all electric combination hoe-shovel capable of being mounted on any suitable truck chassis has been introduced in the ½ cu yd size. The unit is available as hoe only, without basic crane or hoist machinery, or it can be made to allow quick field conversion to crane or clamshell work.

Among important features found on the H5 are three hydraulic circuits plus differential and selective valves that permit concentration of power.

A total of 189,000 lb of ram force is available. A solid digging platform is provided by four outriggers. And the boom telescopes 4 ft to reduce the need for truck moves and to simplify accurate spotting of the bucket. BUCYRUS-ERIE CO., C/O PUBLICITY DEPT., SOUTH MILWAUKEE, WIS.

Concrete Saw Speeds Up Contraction Joint Cuts

A 36 hp concrete saw is now made for high production contraction joint cutting on highways, turnpikes, air fields, and for heavy-duty trenching.

The Model C-363, with a one-piece frame design, distributes the weight and allows easy maneuverability. The manufacturer claims that line-up time is cut in half. Further, a constant weight blade during cutting tends to preven riding out of the cut even on the hardest aggregate at the fastest speeds.

A positive type screw feed raises and lowers the blade into the cut to provide accurate cutting depth control—also compensating for abrasive blade wear.

Separate off-pavement contact wheels eliminate build-up of curing compound on drive wheels.

Although ruggedly built to withstand tough cutting requirements, the C-363 weighs only 135 lb, with better design increasing both strength and durability while reducing weight. CLIPPER MANUFACTURING CO., SUITE 156, 2800 WARWICK ST., KANSAS CITY, MO.

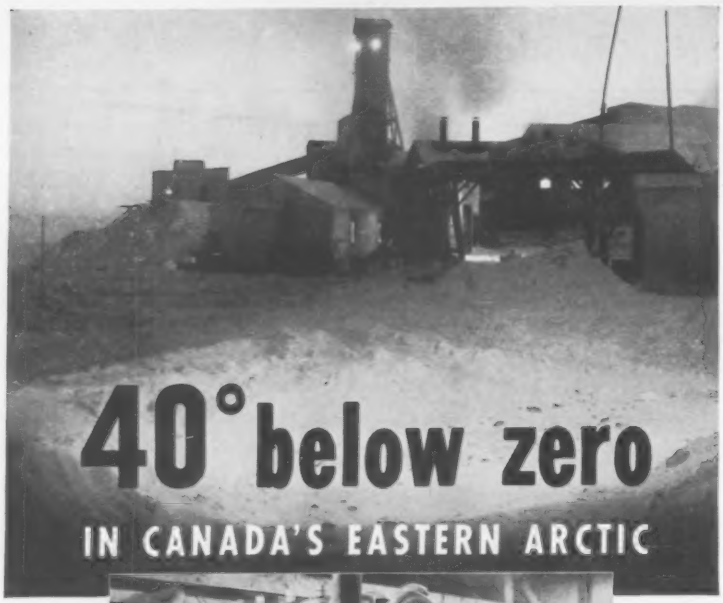
Plastic Panels Cut Heat But Pass Diffused Light

A new heat shielding structural plastic panel reflects more than 80% of the sun's heat, yet allows light to pass through it in diffused form, according to its manufacturer.

"Foil-Glass" consists of a thin sheet of perforated aluminum foil laminated between two layers of fiberglass mat, which are impregnated with a special polyester resin. The panels can be applied to roofs or sides of patios with ordinary handtools and nailed or sawed in the same way as standard plastic panels.

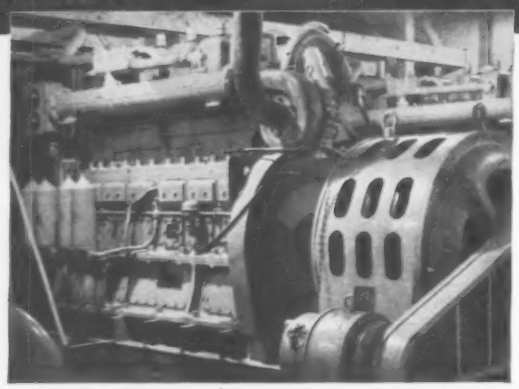
The panels come in four colors — coral, blue, green and yellow — in widths of 26 and 40 in., and in lengths of 8, 10 and 12 ft. Retail cost is approximately $1.25 per sq ft. They are available at lumber yards and building supply dealers. RESOLITE CORP., ZELIENOPLE, PA.

(*New Products continued on page 62*)



40° below zero

IN CANADA'S EASTERN ARCTIC



GENERATOR SETS powered by

WAUKESHA *Diesels*

supply all electric power for mine, mill, townsite and camp

On a northern inlet of Hudson Bay, 1950 air miles northwest of Toronto—where daytime temperatures hit 40° or more below zero, and the miners are Eskimos—is Canada's most northerly nickel mine. In so remote a spot the powerhouse engines must be reliable. They are. Both are Waukesha Diesels. They drive the generator sets that supply *all* electric power for mine, mill, townsite and camp of the North Rankin Nickel Mines, at Rankin Inlet, Northwest Territory, Canada. Production is 250 tons daily; ore is high grade and shipping concentrates run 13% nickel; 2.5% copper. The two Waukesha Diesels are Model LRDBS Turbo-supercharged 6-cyl., 8½ x 8½ in., 2894 cu. in. engines.

■

Waukesha Enginators (engine-driven generator combinations) for Diesel, gas, or gasoline fuels are also available up to 800 KW. Send for literature.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES 378

Precise Torque Control Comes in a Small Package

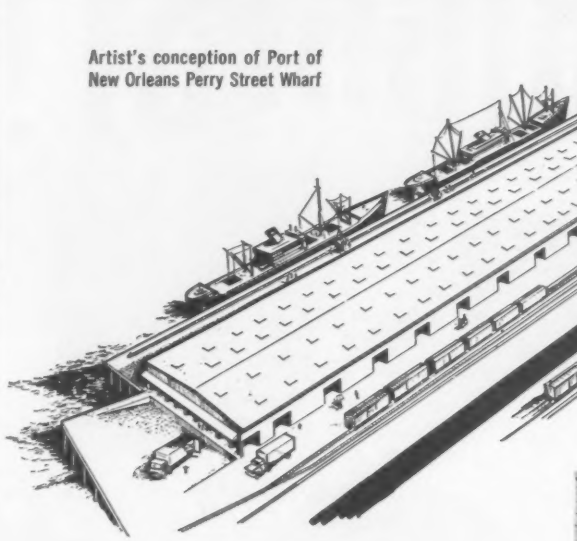
Torque control clutches are available in two standard rating ranges. Models in these ranges run from 0 to 84 in.-lb. and from 48 to 120 in.-lb. They transmit more torque thany any other known unit of equal weight and size, the manufacturer reports.

"Safe-Torque" clutch designs include the one-shot type as well as continuous overriding varieties. The torque settings are adjustable and can be sealed against unauthorized tampering if desired. SCULLY-JONES & CO., 1901 S. ROCKWELL ST., CHICAGO 8, ILL.

Chain Digger Trenches And Can Cut Sod Strips

The M-2 Ditch Witch, a chain digger, can make a trench from 3 in. wide and 48 in. deep to 8 in. wide and 30 in. deep. The machine comes with four speeds forward and reverse, and is available with attachments that can be used to cut 8 in. sod strips at speeds up to 40 fpm. CHARLES MACHINE WORKS, INC., 640 BIRCH ST., PERRY, OKLA.

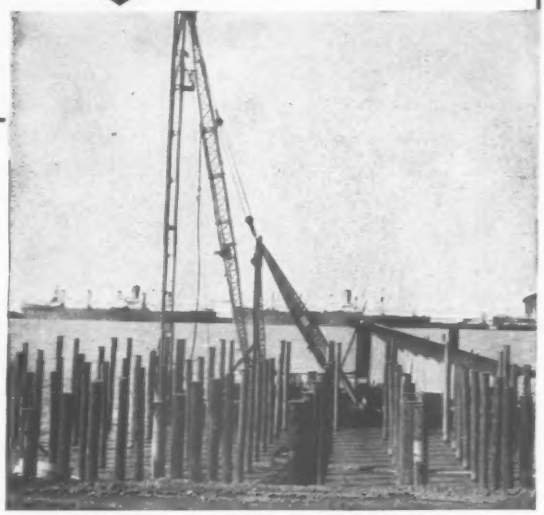
More than 50 miles of Armco Piling provide solid foundation for New Orleans wharf



Artist's conception of Port of New Orleans Perry Street Wharf

Director of Engineering
W. T. Hogg, Board of Port Commissioners, New Orleans, Louisiana
General Contractor
Boh Brothers Construction Company

The 105-foot piles were made by field-welding shorter lengths together. Piles were driven with a barge-mounted pile driver.



The 1000- by 230-foot Perry Street Wharf is part of the Port of New Orleans' 72 million dollar dock improvement program. When completed, this wharf will include berths for loading and unloading two ships, dockside rail lines, truck docks, and a 160,000-square-foot warehouse.

Armco Pipe Piles were selected to provide a solid foundation for the wharf. A total of 2800 piles in 18-, 16-, 14-, and 12¾-inch diameters were driven and filled with concrete. The Armco Piles, field-welded in 105-foot lengths, were tied into the wharf deck with 1-inch reinforcing bars. Design load for each pile is 50 tons.

Many engineers and contractors have found Armco Pipe Piles the most efficient and economical answer for foundations under bridges, buildings, and similar structures. For more details, just send the coupon below. Armco Drainage & Metal Products, Inc., 4618 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO FOUNDATION PILING

ARMCO®

Armco Drainage & Metal Products, Inc.
4618 Curtis Street, Middletown, Ohio

Send me data on Armco Pipe Piles for the following use:_____

_____

_____

Name_____ Title_____

Organization_____

Street_____

City_____ Zone____ State_____

IT'S THE BIGGEST!

THE NEW LE ROI 1200 ROTARY

—world's largest portable rotary air compressor

—with cost-saving twin-unit design

Here's the giant-ecoromy-size portable air compressor that can't be beat for capacity, flexibility, compactness — and certainly not for low-cost air power or money-saving design and performance!

The new Le Roi rotary is a portable cyclone — delivers a full 1200 cfm of air at 100 psi — plenty of power for the *big* demands of pile driving, large-hole quarry drilling, tunnel jobs, multiple pipe line rigs, shaft jumbos, or as a stand-by source of plant air. One 1200 replaces a dozen small portables — eliminates site clutter and the need for extra men and trucks for hauling—minimizes between-job delays and slashes fuel consumption and maintenance.

Twin compressors operate at 1800 rpm, engines at 2000 rpm. Unit weighs 14,700 lbs. dry, has an 18 ft. turning radius, and meets all existing state highway regulations.

Twin-unit design gives you two individually-controlled compressors that can be operated separately for 600 cfm or together for 1200 cfm output. It permits one unit to be shut off when air demand falls below 600 cfm, or for servicing, without interrupting work. Compressors can be alternated to reduce wear — interchangeable engine and compressor parts provide added protection against costly emergency shutdowns in the field.

Get the complete design-performance story from your Le Roi distributor. He'll be glad to send you literature — and even happier to put the new 1200 rotary through its paces for you.

PC-802

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, portable and Tractair® air compressors, stationary air compressors. Write us for information on any of these products.

WABCO

MacDonnell Heads Corps' South Pacific Division

Brig. Gen. Robert G. MacDonnell has been named South Pacific division engineer for the Corps of Engineers. He succeeds Brig. Gen. William F. Cassidy.

General MacDonnell will direct construction of the training-operational base for ballistic missiles at Cooke Air Base in California, which will take $100 million of the $240 million slated to be spent this year on military and civil construction in the division's area.

Corps Designates Whipple Southwest Division Head

Brig. Gen. William Whipple has been made Southwestern Division Engineer for the Corps of Engineers. He succeeds Brig. Gen. Lyle E. Seeman, who has been assigned to the Office of the Deputy Chief of Staff for Logistics, Washington, D. C.

General Whipple was commander of the Communications Zone Base Section in France before his new assignment.

Duke Professor Gets Grant To Study Curved Structures

A U.S. Army Officer of Ordnance research grant of $10,952 to study stresses and strains in doubly curved structures has been awarded R. S. Rowe, professor of civil engineering at Duke University.

"We are now using doubly curved space structures for long span civil engineering, so as to reduce weight and increase strength," Professor Rowe says. "The possibility of using these structures in allied fields seems great."

It is hoped that results of the study will have application in new developments for national defense.

Before going to Duke in 1956, Professor Rowe was associate professor of civil engineering and director of the rivers and harbors section at Princeton.

Clark Elected President Of Building Congress

Bradford N. Clark, partner of Eggers & Higgins, New York City architects, is the newly-elected president of the New York Building Congress. He has been secretary of the organization for the last three years.

The organization includes individuals, companies, trade associations and labor unions—all dedicated to promotion of the general welfare of the building and construction industry.

Elected as vice presidents are Jeremiah Burns, president of Jeremiah Burns, Inc.; Alfred T. Glasset, president of W. J. Barney Corp.; Charles Haines, partner in Voorhees, Walker, Smith & Smith; and Otto L. Nelson, vice president of New York Life Insurance Co.

L. J. McGowan Will Head Foundation Co. of Canada,

L. J. McGowan has been elected president of The Foundation Co. of Canada, Ltd., the dominion's biggest engineering construction firm. Formerly vice president and general manager, he succeeds F. G. Rutley, who moves into the position of chairman of the board.

Mr. McGowan began his construction career in 1919 as a rodman with The Austin Co., Cleveland. In succeeding years he worked as an expediter and estimator. In 1935 he joined the Foundation Companies and his first job involved project development for Ontario Paper Co. He rose rapidly, and in 1955 was appointed vice president and general manager. He continues as general manager.

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(Predraining Problem)

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(Skilled Wellpoint Engineering)

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WELLPOINT CORP.
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SIMPLEX Center Hole Hydraulic PULLERS
Perfected for
PRESTRESSING CONCRETE

Self contained and Remote-controlled pumps and rams in capacities 10 100 tons.
SIMPLEX JACKS
TEMPLETON, KENLY & CO. Broadview, Illinois
2553 GARDNER ROAD, .. BROADVIEW, ILL.

Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, June 26; Next, Jul. 31.
- Wage Rates, Building Board, Lath, Insulation: Last, Jul. 3; Next, Jul. 31.
- Cement, Aggregates, Ready-mixed Concrete, Asphalt: Last, Jul. 10; Next, Aug. 7.
- Iron & Steel Products, Pipe: Last, Jul. 17; Next, Aug. 14.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta †‡	$73.00	$76.00	$76.00	$79.00	$81.00	$86.00	$136.00	.....	.....
Baltimore *	98.00	100.00	100.00	100.00	100.00	105.00	114.00	.....	.....
	100.00g	*105.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*$150.00*	*$144.00*
Birmingham †‡	80.00	82.00	75.00	82.00	85.00	90.00	105.00	.....	.....
	70.50	*70.50*	*67.00*	*70.00*	*70.00*	*85.00*	*75.50*	*70.50*	*70.50*
Boston ‡	93.00f	95.00f	102.00f	102.00f	102.00f	106.00a	.....	.....	.....
	95.00k	*95.00k*	*112.00*	*112.00*	*112.00*	*111.00*	*119.00*	*119.00*	*125.00*
Chicago **	97.00	100.00	94.00	108.00	116.00	117.00	112.00	.....	.....
	105.00	*105.00*	*118.00*	*116.00*	*116.00*	*117.00*	*125.00*	*125.00*	*125.00*
Cincinnati *	93.00	94.25	86.50	90.50	95.00	102.75	116.00	.....	.....
	92.00	*93.25*	*97.50*	*99.50*	*100.25*	*111.25*	*123.50*	*123.50*	*123.50*
Cleveland **	88.00	90.00	90.00	97.00	97.00	101.00	.....	.....	.....
	.....	.....	*100.00*	*100.00*	*99.00*	*101.00*	*115.00*	*115.00*	*115.00*
Dallas ‡‡	74.50	74.50	70.00	70.00	73.00	75.50	120.00	.....	.....
Denver *	*Not in stock*		*122.50*	*122.50*	*122.50*	*127.50*	*130.00*	*148.50*	*158.50*
Detroit ‡	116.50	119.00	115.75	117.00	122.00	122.00	.....	.....	.....
	195.00	*195.00*	*127.75*	*132.50*	*150.00*	*185.00*	*185.00*	*195.00*	*195.00*
Kansas City ‡	120.00	120.00	120.00	120.00	125.00	135.00	.....	.....	.....
	120.00	*120.00*	*120.00*	*120.00*	*125.00*	*125.00*	*180.00*	*225.00*	*225.00*
Los Angeles ‡	*92.00*	*92.00*	*92.00*	*92.00*	*92.00*	*92.00*	*120.00*	*125.00*	*125.00*
Minneapolis #	*185.00m*	*185.00m*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*
Montreal ab	87.00	94.00	87.00	88.00	104.00	123.00	.....	.....	.....
	165.00	*165.00*	*165.00*	*165.00*	*165.00*	*165.00*	*170.00*	*170.00*	*170.00*
New Orleans †	97.00	97.00	90.00	91.00	90.00	97.00	121.00	.....	.....
†	*105.00*	*105.00*	*94.50*	*115.00*	*115.00*	*115.00*	*127.50*	*127.50*	*147.50*
New York ‡	108.00	109.00	114.00	116.00	116.00	120.00	.....	.....	.....
	.....	.....	*119.00*	*120.00*	*120.00*	*121.00*	*164.00*	*164.00*	*164.00*
Philadelphia ‡	.....	.....	Range from 100/120			105/125	105/125	.....	.....
			Range from 110/140			*115/145*	*125/180*	*158.00*	*168.00*
Pittsburgh 2	120.00	120.00	125.00	120.00	125.00	130.00	145.00	.....	.....
	135.00	*135.00*	*145.00*	*155.00*	*140.00*	*145.00*	*165.00*	*168.00*	*168.00*
St. Louis #	119.00	121.00	129.00d	129.00d	129.00e	134.00e	.....	.....	.....
	.....	.....	*137.00*	*137.00e*	*137.00e*	*141.00e*	*195.00e*	*195.00*	*195.00*
San Francisco ‡	*78.00*	*78.00*	*80.00*	*80.00*	*80.00*	*80.00*	*95.00*	*110.00*	*110.00*
Seattle †	*69.00*	*67.00*	*69.00*	*69.00*	*69.00*	*69.00*	*75.00*	*88.00*	*88.00*
Toronto a	92.50	93.50	90.75	90.00	90.00	90.00	.....	.....	.....
	115.00	*115.00*	*115.00*	*120.00*	*125.00*	*126.00*	*142.00*	*135.00*	*145.00*

LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
2x12 Rgh	12x12 Rgh	⅜"	¾"
$121.00	$156.00	$22.32	$27.24
118.00	160.00	21.78	26.58
.....	.....	25.92	31.60
140.00	140.00	22.46	27.37
129.50	127.00	25.00	30.48
.....	.....	25.37	30.93
130.00	125.00	18.72	22.80
.....	.....	13.92	16.98
130.00	.....	25.00	30.48
.....	.....	16.56	20.16
.....	.....	16.61ab	*20.25ab*
.....	.....	19.80	24.25
122.00	122.00	.....	.....
.....	.....	.....	.....
181.00	181.00	18.72	22.80
.....	.....	.....	.....
240.00	250.00	25.92	31.60
.....	.....	.....	.....
214/224	214/224	26.00	32.00
.....	.....	.....	.....
140.00	168.00	25.92	31.60
.....	.....	.....	.....
.....	.....	18.72	22.80
.....	.....	.....	.....
.....	.....	13.22	14.91a
.....	.....	.....	.....
92.00	.....	.....	.....
.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. ‡‡ Retail, truckload lots, 8/8 Mfdbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. [a] Spruce. [b] Tax exempt. [c] 5M lots. [d] 8, 10, & 12 ft. lengths. [e] 8 to 16 ft. lengths. [f] Hemlock [g] No. 1 common. [j] 8 ft. lengths. [k] No. 3 common. [l] Incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. [m] Up to 16" [R] revised

PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, ⅜", $146.00; ¾", $166.00. Exterior, waterproof, ⅜" $150.00; ¾", $170.00. For other centers add rail freight increment from table on proper size. [a] Lower rate by water shipment. [b] 50,000 lbs. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950a

	Single or Double Strength A quality	B quality
Atlanta	78%c	78%c
Baltimore	74%d	76%d
Birmingham	82%	83%
Boston	72–10%	72–10%
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74–2–10%	74–2–10%
Dallas	76%	76%
Denver	74%	74%
Detroit	74–10–10%	74–10–10%
Kansas City	74–10–10%	74–10–10%
Los Angeles	70%	70%e
Minneapolis	71–10%	71–10%
Montreal	40–10–5%bc	40–10–5%b
New Orleans	73%	70%
New York	79–10%	79–10%
Philadelphia	74–10%	73–10%
Pittsburgh	72%	72%
St. Louis	72–10–10%	72–10–10%
San Francisco	60%–25%	68%–25%
Seattle	67%	72%

Prices of 60% Ammonia Gelatin in $0.15 per lb. higher than 40% in U. S.; $1.75 per 100 lbs. higher in Canada.

EXPLOSIVES

	Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	$0.2615
Baltimore	.2615
Birmingham	.2465
Boston	.2615
Chicago	.2615
Cincinnati	.2615
Cleveland	.3015
Dallas	.2600
Denver	.2665
Detroit	.2615
Kansas City	.2665
Los Angeles	.2640
Minneapolis	.2665
Montreal	22.05h
New Orleans	.2665
New York	.45g
Philadelphia	.2615
Pittsburgh	.2615
St. Louis	.2665
San Francisco	.2615
Seattle	.2640

Glass: [a] Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. [b] sales tax extra. [c] 77% or single strength. [d] Discount 6/15/52. [e] 77% for double strength.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. [g] In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. [h] F.o.b. Bellowell (near Montreal), per 100 lb. farcite, 40%. Farcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E of the Mim., except Fla and Me	$0.2065	$0.2465	$0.2615
W of Miss. to Rocky Mtn. States, Fla. and Maine	.2115	.2515	.2665
Rocky Mtn. States	.2115	.2515	.2665
Pacific N. W. States	.2090	.2490	.2640
Pacific S. W. States	.2065	.2465	.2615

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50/68	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.88/93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	.....	3.80a	.....	4.40a
New York	S. L. Sap Pine	2.00	4.00	3.00	6.00g
	Mixed Oak	2.50	4.50	3.50	6.50g
Philadelphia	Red Oak	2.85/4.05	4.40/4.60	3.20/3.40	4.40/4.60
St. Louis	Mixed Oak	2.75	3.50a	3.00h	3.85ah
San Francisco	Douglas Fir	1.91ef	2.80ef	2.69ef	4.07caf

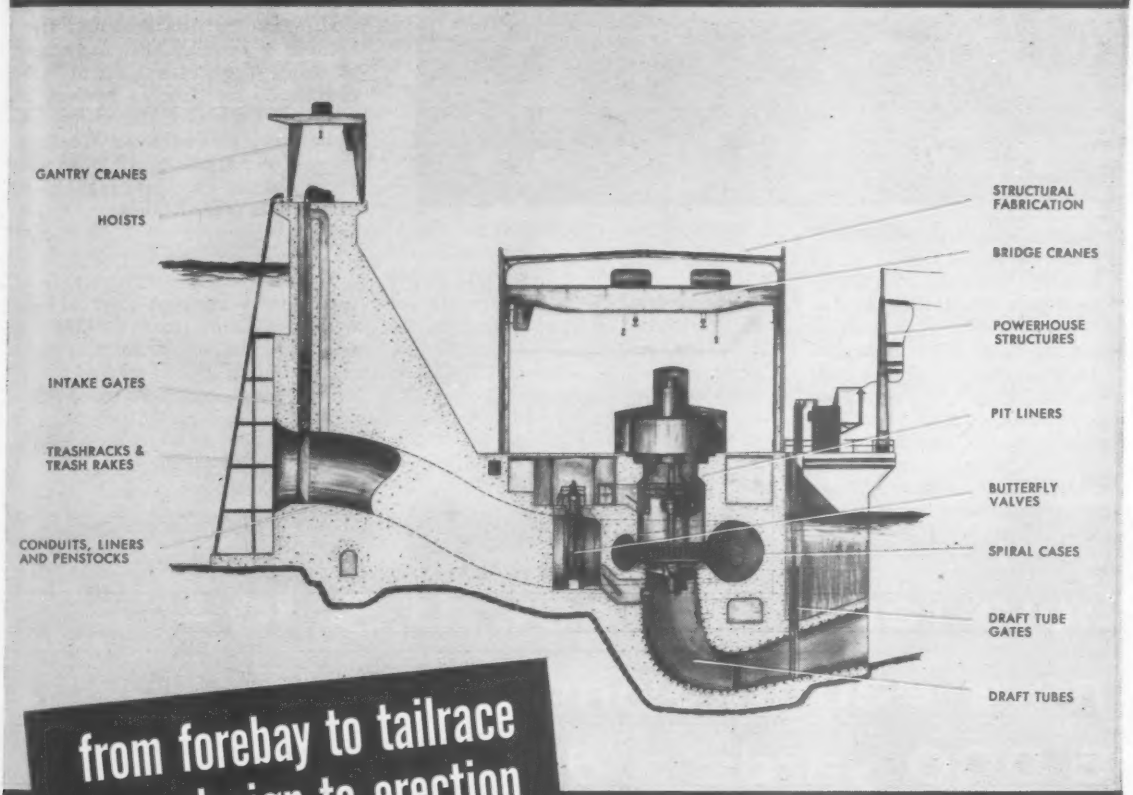
Tr.—Treated; Untr.—Untreated. [a] Creosoted. [c] Empty cell. [e] Green f.o.b. cars. [g] 7 x 9 x 8' 6" * Add 75c/tie freight charge to Birmingham. [h] 7" x 9" x 9½"

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.11
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	31.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	2.05
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	10.70

HYDRO EQUIPMENT



from forebay to tailrace —from design to erection

BY YUBA

The variety of engineered products pictured above suggests how you can profitably employ Yuba to design, custom-build and erect hydro equipment. For it shows typical Yuba equipment in operation or being installed on important projects from California to Pennsylvania . . . from Afghanistan to Korea.

Your investigation will *prove* how Yuba's ability to design, fabricate, machine and erect anywhere in the world is backed by decades of experience, know-how of skilled personnel, and complete production facilities of Yuba's four heavy equipment plants in the East and West.

From forebay to tailrace—from design to erection, Yuba handles the complete job as a package responsibility. This relieves both user and contractor of the need for coordinating production, delivery and installation. Ask for Bulletin No. HY-51, describing Yuba's hydroelectric equipment and services, or ask for sales engineer to call.

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HYDRO EQUIPMENT SALES OFFICES

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YUBA

Key to 75,000 cu yd per day production relocating U.S. 10 in North Dakota is *enough* of *right kind* of equipment, *properly managed*. 3 skilled contractors (Tennefos Const. Co., Wm. Collins & Sons, Inc., Schultz & Lindsay Co., Inc.) used 99 major pieces of equipment — including 35 scrapers, 12 graders, 39 tractors. Bulk of earthmoving was done with LeTourneau-Westinghouse Tournapulls®...12 "C's" with 18-yd Fullpak® scrapers; eight 27-yd "B's", plus older models.

With 4 big power plants lighting work area, dirtmoving continued 20 hr a day. In just 6 of these long days, 2 of the project's contractors, Collins and Tennefos, moved total of 450,000 yd of sand, clay, some rock. Each of the 3 firms handled ⅓ of basic 6,316,870-yd project, that stretched 40 miles from Jamestown to outskirts of Valley City. Firms then began work as combine on 2,300,000-yd job building bypass around Valley City. U.S. 10 is now part of new Interstate Highway System, designed for speeds to 70 mph, sight distances of 600′. Time exposure below shows work area at night.

Photo report on new U.S. 10— where earthmoving pace is 75,000 yards a day

Fast-loading B Fullpaks moved 10 big loads an hour on 1800′ one-way cycles. C Fullpaks, on shorter, 1300′ hauls, made 14 trips an hour. Main pushers were D-8's, D-9's. Sup't. Lawrence L. Miller praises Tournapulls, says: *"They're doing a fine job for us. And the 'C's' can't be beat. We use them for all types of work, including finishing. They're rugged and dependable."* On one phase of job, C Fullpaks loaded in average of *22 seconds*, completing 4425′ cycles in less than 4 minutes.

Traffic on U.S. 10 will increase 400% by 1975, experts say . . . and Tournapulls gave sample of things to come with heavy traffic on haul road. Fast-moving "B" (center) has speeds to 28.7 mph. New "B's" are available with torque converter, 335 hp, 31.7 mph speed. 210-hp "C" can move at 29.9 mph. Other speed features of 'Pulls† include instant electric control of bowl, apron, tailgate, and steering action . . . and fast-loading bowl, low and wide for quick, nearly horizontal in-rush of dirt.

Four big Adams† 660 motor graders maintained haul roads for high-speed hauling, kept fill areas workable, did finishing on top of 4-lane, 48′ roadway. Purchased especially for this project was a torque-converter 190-hp POWER-*Flow*®. Sup't. Miller says: *"We like the power and speed of the '660'. Its ruggedness really helps get the job done. It does a fast and accurate grading job. And the torque converter in our* Power-Flow *660 gives us absolute control over our work, always."*

"Jack-of-all jobs" on the huge project was a rubber-tired Tournatractor® — push-loading, dozing, towing. Because it *goes anywhere*, under its own power — at speeds to 17.2 mph — Tournatractor is perfect utility tractor on big, spread-out jobs like this one. In minutes it can run back to handle a backfill job, or run ahead for preparatory work. *Contact your LeTourneau-Westinghouse Distributor for facts and figures on Tournapulls, Tournatractor, and Adams graders. No obligation.*

†Trademark BPCPCTG-1688-DCJ-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

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Marginal Type Wharf For Canada

Precast cribs will be towed two miles from dry dock to Saint John wharf site; then sunk in place

This $1,276,063 contract includes precasting, in a dry dock two miles from the site of the wharf, seven reinforced concrete cribs 108 ft long, 40 ft wide and 42 high, towing them to the site on high tide and then sinking them on a falling tide by admitting water through the crib walls. Tides in Saint John Harbour range from 22¼ ft on the neaps to 28½ ft on the springs. The floating cribs draw 28 ft.

The rock ledge on which they will be placed has been drilled, blasted and excavated to increase depth at low water to 25 ft from the original 10 ft.

Foundation Marine, Limited, Halifax is building this marginal type wharf for the Dept. of Public Works, Ottawa. G. Millar is Chief Engineer, Harbors and Rivers Engineering Branch.

The cribs, designed to resist external pressure while floating and internal pressures when sunk and fully ballasted, will rest on a rock and stone mattress ranging from two to six feet and sloping inward and up at 1¼% grade, raked to counteract the pressure of the fill. Spaced three feet apart, they will be separated by a permeable rock core to prevent a hydraulic head from developing.

A concrete cope wall of 15 ft on top of the outer face of the crib brings the wharf up to the required 32 ft elevation above low water. The fill behind the concrete cribs will be retained on the north face of the wharf by a concrete gravity wall and sheet piling, on the south face by timber crib-work.

Completed, the wharf will have a top area of 5 acres with harbor faces of 490 ft on the north, 555 ft on the west and 435 ft on the south.

The completion schedule is two years, by February, 1960.

Minimum wages set for the job include: carpenters and joiners, $1.70; cement finishers, $1.30; pile drivers and derrick men, $1.15; timbermen and cribmen, $1.20; tractor operators, $1.15-$1.35; truck drivers, $1.10; laborers, $1.05.

The unit prices on the contract are:

Bids: 2-5-58 Items	Unit	Quantity	Unit Prices 1C
Existing structures, remove	ls	job	$29,477
Excavation, general	ls	job	75,000
Existing storm sewers	ls	job	2,775
Fill, general	t	306,000	0.80
Cr stone mattress	t	8,400	2.70
Crib seats.....level	ea	7	7,250
Cement, 87½ lb/bag	bag	110,880	1.25
Concrete cribs	cy	10,000	12.25
Reinforcing steel	lb	2,030,170	0.098
Cribs.....tow & place	ea	7	7,875
Concrete keys, precast	cy	25	125.00
Rock fill	t	5,100	2.25
Conc slab, anchor & curb	cy	280	36.50
copewall, gravity wall & sheet pile footings	cy	5,525	18.80
Steel sheet piling	t	202	250.00
.....drive	sf	12,638	0.95
.....trench	lf	148	10.00
Steel, struct & misc	lb	40,000	0.35
Tie rods, nuts & turnbuckles	lb	53,000	0.28
Weep holes	ea	82	1.50
Cribwork, untreated timber	cf	80,000	0.60
creosoted timber	cf	16,000	0.45
Timber, square sawn	fbm	46,000	0.40
piling, untreated	lf	1,300	2.30
Ladders, on concrete	ea	7	400.00
on stl piling	ea	4	150.00
Dredging	cypm	8,000	2.50
Bollards	ea	12	800.00
Cleats	ea	8	50.00
Mooring rings	ea	8	15.00
Guard seats	ea	210	13.50
Drop manhole & outlet	ea	1	550.00
Outlet boxes, frames & covers	ea	3	105.00

Awarded: 2-24-58 Completion: 2-24-60

Effective wages include: carpenters, $3.325; tractor operators, $3.43; heavy duty equipment operators, $3.55; common laborers, $2.605.

1C	John C. Gist, Florin, Cal	$1,169,265
2	Duncanson-Harrelson Co., and Western Bridge Co., Richmond, Cal	1,222,623
12	Lord & Bishop, Inc., and Macco Corp., Sacramento, Cal	1,423,880

Bids: 4-9-58 Items	Unit	Quantity	Unit Prices 1 C	2
Struct exc, above elev 140'	cy	2,720	$9.00	$12.50
below elev 140'	cy	710	9.00	20.00
Cofferdams	ls	job	58,000	40,000
Conc fndns below elev 140'	cy	950	22.00	25.00
above elev 140'	cy	4,350	22.00	33.00
above fndns, ip	cy	4,275	33.00	37.00
Portland cmt	bbl	14,000	5.00	5.00
Stl reinf bars, ip	lb	1,050,000	0.16	0.16
Dampproofing	ls	job	1,000	1,000
Stl grill & anch bolts, ip	lb	14,800	0.60	0.60
Misc metalwork, ip	ls	job	60,000	56,000
Temp xing over RR, ip	ls	job	35,000	30,000
Bearings, ip	lb	92,000	0.27	0.40
Struct stl, ip	lb	1,786,000	0.20	0.188
cleaning & painig	ls	job	25,000	20,000
Ballast trough, ip	ls	job	58,000	70,000
Membrane waterprfg, ip	ls	job	17,000	15,000

Completion schedule: 480 working days
Liquidated damages: $100/day

RR Relocation Bridge at California Reservoir

Separate bids on excavation and concrete foundations at elevations above and below 140 ft, were taken for this bridge over the Feather River in Butte County, California. It is part of the Western Railroad relocation around the proposed Oroville Reservoir.

The $1,169,265 award by the California State Dept. of Water Resources, Sacramento, Cal., went to John C. Gist, Florin, Calif. on a bid averaging $1,063 per lin ft for the 1,100 ft plate girder bridge on concrete piers. This was less than 5% below the second of the twelve bids.

Specifications for Class A concrete are 4,000 psi for Class B, 3,000 psi.

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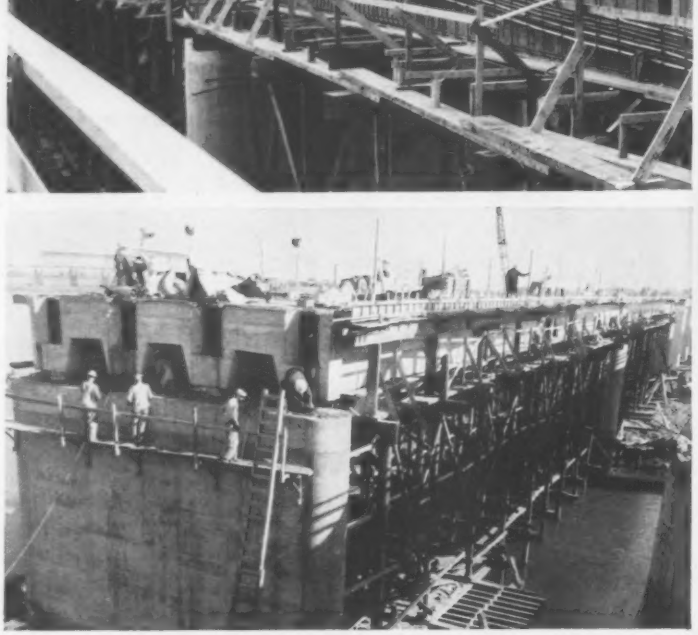
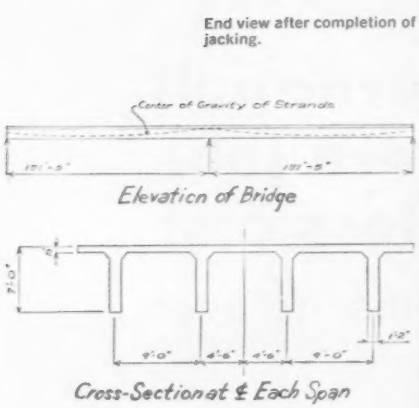
WHERE QUALITY IS A HABIT

PRESTRESSED CONCRETE BRIDGE across Feather River at Marysville, California • Designed by Ben C. Gerwick Inc. with William J. Talbot Jr. as Chief Engineer • Consultants on prestressed concrete continuous spans—T. Y. Lin & Associates • E. E. Watkins, Road Commissioner of Sutter County, Cal. was responsible for the project, with Charles W. Deterding in charge. Contractor—Pacific Bridge Co.

Roebling strands encased in flexible metal hose being placed in form. Path of strands is at highest point over center pier.

End view after completion of jacking.





How to build a long-span vehicular bridge at an initial saving of $12,299

Here is an excellent example of a continuous prestressed concrete bridge, with two 151-ft. spans across the Feather River at Marysville, California. It effects savings—both initial and in operational maintenance—that can only be considered impressive.

As measured by bids, both steel and prestressed, the initial savings were $12,299. Projected maintenance savings as well as insurance savings will accrue over the years to add to this already attractive cost picture.

T. Y. Lin, consultant on continuous prestressed concrete spans, stated in an Engineering News Record article:—

"General opinion is that cost of long-span continuous prestressed concrete bridges might not be as economical as conventional designs using structural steel. But the bidding and the successful completion of this bridge across the Feather River at Marysville, Calif., indicated that this type of prestressed concrete bridge can be competitive.

"A total of only thirty-two 1 11/16 in. strands (each 300 ft. long) was employed for prestressing the two continuous spans. These cables, supplied by John A. Roebling's Sons Corp., were easily laid, tensioned and grouted. Simple T sections, instead of modified T or box sections, were adopted for the bridge, thus minimizing the cost of formwork and facilitating the placing of concrete.

"In addition to the two main spans, the two-lane bridge has 23 spans of 80 ft. precast, prestressed concrete T-beams. Roadway width for the two-lane structure is 28 ft. and sidewalks increase the width between railings to 35 ft. 5 in.

"The four cast-in-place T-girders for the continuous spans are spaced 9 ft. c-c and are 7 ft. deep. The 8 in. thick deck forms the flange of the T section."

The savings wherever prestressed is employed speak for themselves. We invite you to get in touch with us on anything that has to do with this really remarkable building method. Since prestressed's introduction into this country, we at Roebling have pursued and championed it as a construction mode with the results shown here... and the Feather River Bridge is but one of many, many similar examples. Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
July 28 Connecticut
STREETS AND ROADS
July 28 Connecticut July 29 Massachusetts

▲† **Vt., Winooski**—MISSILE FACILITY—BA 8/7—U. S. Eng., 150 Causeway St., Boston, Mass., missile facility, Ethan Allen Air Force Base. $3,000,000-$4,000,000. Anderson, Nichols & Co., 150 Causeway St., Boston, Mass., engrs. CD 9/19.

HEAVY CONSTRUCTION—LB & CA

▲ **VERMONT**—State Dpt. Hys., State House, Montpelier, Bids opened 7/11,

The Lane Constr. Corp., 965 E. Main St., Meriden, Conn., LB $5,954,987, bypass proj. being graded, drainage, sub-base with bit. concrete surf. course, 10 composite WF beam bridges, 2 bridges each composed of 2 deck cantilever truss spans connected with suspended deck truss span with 2 composite WF beam approach spans, Int. Rd. No. 91, I 91-1 (2), Brattleboro. CD 6/26.

BUILDINGS—LB & CA

▲ **Sanders Constr. Co.**, 415 Congress St., Portland, Me. CA Approx. $24,500,000. GENERATING PLANT, BOW, N. H. Public Service Co. of New Hampshire, 1087 Elm St., Manchester, N. H. Jackson & Moreland, Inc., Park Square Bldg., Boston, Mass., engr.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
July 29 Maryland
STREETS AND ROADS
July 31, August 5 New Jersey

HEAVY CONSTRUCTION—LB & CA

▲ **A. S. Wikstrom, Inc.**, Box 217, Skaneateles, N. Y., CA $9,750,000. (permitting necessary road damage) channel imprvt. incl. excavating approx. 3,000,000 cu. yd. material in Tailrace Area for Barnhart Island Power Plant in area of St. Lawrence River channel, St. Lawrence Co., Spec. No. PA-5-11038 Contr. 47, NEW YORK, Power Auth. of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids June 19. CD 6/23, under LB.

▲ **Union Switch & Signal Co.**, 350 5th Ave., New York, Zone 1, N. Y. LB $5,018,606 (2 bidders), furnishing, installing block signalling and interlocking equipment for rehabilitation of Lexington Ave. Line, IRT Div. Astor Pl. to North 42nd St. Contr. S-90, Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids July 11. CD 6/10.

BUILDINGS—LB & CA

▲ **Blake Constr. Co.**, 33 E. S.W., Wash., D.C., LB $4,128,000 six story DEPARTMENT of EMPLOYMENT SECURITY BLDG., adjacent to new State Office, BALTIMORE, MD. Dpt. P. Imprvts., 506 Park Ave., Baltimore, Md. Bids July 10. CD 6/16.

▲ **Halethorpe Warehouse Corp.**, c/o Ben Ronis, archt. 3442 Oakwood Terrace N.W., Wash., D. C., CA Est. $3,000,000-$5,000,000. DISTRIBUTION CENTER, WAREHOUSES, TERMINALS and PROCESSING PLANT, ELKRIDGE, MD. Great Atlantic & Pacific Tea Co., 420 Lexington Ave., New York 17, N. Y. CD 6/20, under Md., Halethorpe.

▲† **Bethlehem Steel Co.**, E. 3 St., Bethlehem, Pa. CA $6,907,500. erection structural steel for addnl. office bldg. for US HOUSE OF REPRESENTATIVES, WASH. D.C. Architect of Capitol, U.S. Capitol, Wash. D.C. Harbeson, Hough, Livingston, & Larson, Architects Bldg., Phila., Pa., archts. Bids June 11. CD 6/27, under LB.

SOUTH

BUILDINGS—BA

▲ **Tenn., Memphis**—HOUSING—BA 7/31—Memphis Housing Auth., 700 Adams St., 320 public housing, Cump Blvd. $5,100,000. CD 9/14/56.

BUILDINGS—SLC

▲ **Fla., Miami**—OFFICE—Atlantic Coast Line R.R. Co., L. E. Bates, ch. engr., 71 Broadway, New York 6, N. Y., soon lets contract 17 story, steel, limestone glass mosait facing office bldg. $10,000,000. Kem, Bunch & Jackson, 33 S. Hogan, Jacksonville, archts.

HEAVY CONSTRUCTION—LB & CA

▲ **Dravo Corp.**, Neville Island, Pittsburgh, Pa., CA $13,452,110, Ohio River Dam and high lift locks to replace Dams and Locks 7 and 8 at Midland and Newell, Pa., and No. 9 at New Cumberland, W. Va., WEST VIRGINIA and PENNSYLVANIA. U. S. Eng., New Post Office Bldg., Pittsburgh, Pa. CD 10/1, under Ohio and West Virginia.

▲ **J. A. Jones Constr. Co.**, 209 W. 4th St., Charlotte, N. C. LB $7,610,000. four general cargo berths, 2 warehouses, roads, tracks and 1,800 ft. marginal dock, CHARLESTON, S. C. S. C. States Ports Auth., 1 Vendue Range, Charleston, S. C. Bids July 10. CD 6/11.

▲† **B. B. McCormick & Sons, Inc.**, 430 1 Ave., Jacksonville, Fla., CA $3,597,408, exten. Runway 18L-36-R, Naval Air Station, Cecil Field, NBy-10242, Spec. 10242/57, JACKSONVILLE, FLA. P. Wks. Office, Sixth Naval Dist., Bldg. 13, Charleston, S. C. Bids June 24, awarded July 3. CD 7/9, under LB.

▲† **Newport News Shipbuilding & Dry Dock Co.**, Shipyard, Newport News, Va., CA $5,751,850, supplying, installing 4 powerhouse turbines for Barkley Dam, Grand Rivers, Lyon Co., KENTUCKY. U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn. Bids June 10, awarded July 3. CD 6/16, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
July 29 Illinois, Indiana
STREETS AND ROADS
July 29 Illinois, Indiana

BUILDINGS—BA

▲ **O., Toledo**—BA 8/7—Washington Twp. School Dist. Bd. Educ., 5700 Whitmer Rd., Washington Twp. Senior High School, and Northwoods Grade School addn. $3,200,000. Plans deposit $60 for high school and $10 for grade school. Extended date. Thomas D. McLaughlin & John J. Keil, 500 Dominion Bldg., Lima, O., archts. CD 6/24.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Dpts. Bldg., Columbus, O.—**J. A. Jones Constr. Co. of Charlotte, N. C.**, P.O. Box 108, Berlin Heights, O., CA $3,546,676, est. $2,962,300 c. conc. paving continuous steel beam bridge with concrete deck and substructure, Bridge ATB-1-1362, State Rte. 46 over State Rte. 1, Bridge ATB-1-1403, State Road over State Rte. 1, grade separation, Bridge ATB-1-1450 over N.Y.C. R.R., continuous steel beam bridge, Bridge ATB-1-1524 Plymouth Rd. over State Rte. 1, 4.551 mi. S.R. 1, Section 12.89, ACI-1103 (23), Plymouth and Ashtabula Twps., Ashtabula Co.;

O.—**C. F. Replogle Co.**, 122½ N. Court St., Circleville, O., CA $3,910,687, est. 4,100,000 c. conc. paving continuous steel beam bridge Bridge BUT-25-0279 over LeSourdsville Rd.; continuous welded steel girder bridge, BUT-25-0376 existing U. S. Rte. 25 over proposed U.S. Rte. 25, grade separation with N.Y.C. R.R., Bridge No. BUT-25-0404, over N.Y.C. R.R., continuous steel beam bridge BUT-25-0534, Tylersville Rd. over proposed U.S. Rte. 25 4.361 mi. U.S. Rte. 25, Section 2.59 mi. ACI-1101 (14) Union Twp., Butler Co.;

O.—**The Horvitz Co.**, 4375 E. 146 St., Cleveland, O., CA $3,561,537, est. $4,303,200 c. conc. paving continuous riveted steel girder bridge Bridge No. LAK-1-1822, Vrooman Rd. over State Rte. 1, continuous riveted steel girder bridge, Bridge No. LAK-1-1905 over Paine Creek, 3.812 mi. Painesville and LeRoy Twps., S.R. 1, Section 1655, Lake Co. Grand total $11,018,900. Bids June 24. CD 7/8, under LB.

▲ **Robert R. Anderson Co.**, 4550 W. Patterson St., Chicago, Ill. LB $5,246,310. 2 grade separations at Northwest Expressway and Jefferson Park R.R. Station, BUG-265 (17) and steel bridges, one for railroad and one for Northwest Expressway, BU-265 (17), CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. Bids July 8. CD 7/3.
W E Constr. Co., 2751 Clybourn St., Chicago, Ill. LB $3,128,098. (a) temporary grade separations (b) permanent railroad grade separations (c) permanent highway (Northwest Expressway) separation, tri-level job Northwest Highway over Chicago & Northwestern R.R. right-of-way (Chicago, Ill.).

▲ **M. J. Boyle & Co.**, 2480 Elston Ave., Chicago, Ill. CA $3,864,334. (substructure) bridge at Harrison St. at Chicago River, CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 6/10/57.

▲† **Lane Constr. Corp.**, 965 E. Main St., Meriden, Conn. LB $10,306,267. (11 bidders), airfield pavements, lighting and fuel facilities, Wurtsmith Air Force Base, OSCODA, MICH. U. S. Eng., 600 E. Jefferson St., Detroit, Mich. CD 5/12.

BUILDINGS—LB & CA

▲ **American Bridge Div.**, 208 S. LaSalle St., Chicago, Ill., CA total $120,000,000, PRIMARY and STRUCTURAL MILL at Chicago's South Works, 8135-65 Brandon, CHICAGO, ILL. United States Steel Corp., 79 Broadway, New York, N. Y. CD 3/19/56.

▲ **East St. Louis Housing Auth.**, 810 Spivey Bldg., East St. Louis, Ill., rejected bids June 26, 500-HOUSING units. area bounded by Missouri Ave., Broadway, 13 and 16 Sts., Proj. No. ILL 2-7, EAST ST. LOUIS, ILL., LB $8,090,000. CD 7/8, under LB.

▲ **Morris Handler Co.**, 2718 Chicago Ave., Chicago, Ill. CA $5,000,000 (1) Villa Moderne HOTEL, (2) Swimming Pools, sewage treatment plant, bit. paving, NORTHFIELD, ILL. Maryland Hotel, 900 N. Rush St., Northfield, Ill. Sidney H. Morris, 134 N. LaSalle St., Chicago, Ill., archt. Awarded July 3.

▲† **Knapp-Stiles & Assocs.**, 1555 Eastern S.E., Grand Rapids, Mich., CA $3,814,361, 235 unit Capehart HOUSING (second increment), K. I. Sawyer Air Force Base, MARQUETTE, MICH. Base Procurement Officer, K. I. Sawyer Air Force Base, Marquette, Mich. Bids June 18. CD 5/21.

WEST OF MISSISSIPPI

STATE HIGHWAY LETTINGS
BRIDGES
July 31 Missouri
STREETS AND ROADS
July 31 Missouri

HEAVY CONSTRUCTION—LB & CA

▲† **George A. Fuller Co.**, 3100 W. 8th St., Los Angeles, Calif., LB $11,762,420, est. $13,707,996 (14 bidders) constr. launch facilities and utilities Squadron 1,

(Continued on page 75)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

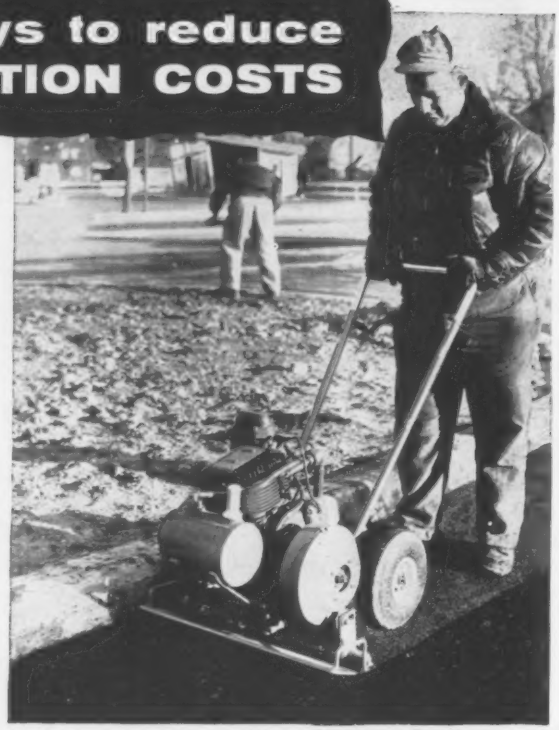
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

2 sure ways to reduce COMPACTION COSTS



THE BARCO RAMMER

Put Barco Rammers on the job and watch the results. One of the biggest advantages they offer is ability to handle work in minimum time.

HIGH DEGREE COMPACTION — In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method) — EASILY! EFFICIENTLY! ECONOMICALLY!

FOR TOUGH JOBS — The Barco Rammer is especially useful for compacting fill in restricted areas close to walls, culverts, and abutments — in trenches, ditches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

ONE MAN OPERATION — On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

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THE BARCO VIBRA-TAMP

The new Barco VIBRA-TAMP is a proven tool — superior in design and performance — backed by leading equipment distributors representing Barco in all parts of the country.

VERSATILE PERFORMANCE — For vibratory compaction of granular base materials and tamping bituminous surfacing.

ECONOMICAL — to buy, operate, and maintain! No special tools required. Saves your bigger, costlier equipment. Tamp up to 750 sq. yds. per hour. A real work-horse on sand, gravel, soil, chippings!

EFFICIENT, DEPENDABLE — One man does the work of many with VIBRA-TAMP. Self-propelled. Operates in any weather. Works flush against curbs, foundations, and walls. Simple design and quality construction keep the machine on the job day in and day out. Moving parts fully enclosed. Handle adjustable to comfortable height.

Ask for Catalog 630

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BARCO RAMMER
for High Degree Soil Compaction

FOUNDED 1908
BARCO
PRODUCTS BACKED BY EXPERIENCE

514H Hough St., Barrington, Ill.
BARCO VIBRA-TAMP
for Granular Fill and Bituminous Surfacing

(Continued from page 73)

Warren Air Force Base, ENG-25-066-58-154, CHEYENNE, WYO. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids July 15. CD 7/8.

BUILDINGS—LB & CA

▲ **Rob. E. McKee, General Contractor, Inc.,** Box 2848, Dallas 9, Tex. CA **$6,748,000.** Federal RESERVE BANK alterations, addns., DALLAS, TEX. Federal Reserve Bank, Earl B. Austin, 400 S. Akard, Dallas, Tex. Bids May 27. CD 6/13, under LB.

▲† **U & C Constr. Co., (United Builders & Cay, Inc.)** 1616 Republic Bldg., Oklahoma City, Okla. CA $7,981,900. 490 unit family HOUSING. Kirtland Air Force Base, Inv. No. 29-601-58-120, ALBUQUERQUE, N. M. Dpt. Air Force, c/o Directorate of Procurement, Kirtland Air Force Base, N. M. Bids June 5. CD 6/24, under LB, Airports.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

August 13 California

STREETS AND ROADS

August 5 Idaho **August 13, 14 California**

▲† **California**—BA 9/11—U. S. Eng., 1209 8th St., Sacramento, constr. Success Dam on Tule River, Tulare Co., involving earth-rock fill dam, 3,500 ft. long and 140 ft. high; earth fill dike, 7,600 ft. long and 40 ft. high, 1,340,000 cu. yd. unclassified excav., 6,050,000 cu. yd. borrow excav., 1,097,000 cu. yd. impervious compacted fill, 3,846,000 cu. yd. pervious compacted fill, 850,000 lb. reinforcing steel and constr. government camp, Spec. 2280A, ENG-04-167-59-8. $7,000,000. CD 9/10.

▲ **Utah, Salt Lake City**—ADMINISTRATION BLDG.—BA 8/14—Salt Lake City Corp., City-County Bldg., administration bldg. for municipal airport. $3,800,000. Extended date. Ashton, Evans & Brazier, 24 SW Temple St., archts. CD 7/1.

BUILDINGS—BA

▲ **Calif., Los Angeles**—OFFICE—BA 8/27—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, 9 story, bsmnt., and roof structures about 542,000 sq. ft. floor space and 7 story, 247,000 sq. ft. parking garage with basement and subbsmnt., Office Bldg. No. 2 for Dpt. Finance, W. O. 3848GC-3 and W. O. 4001GC-7. $7,920,000. Plans deposit $100. CD 5/18/56.

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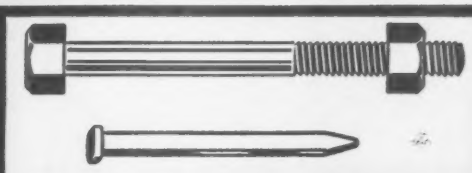

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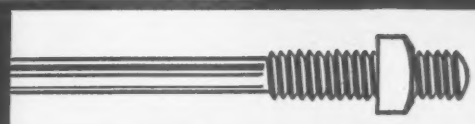

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Name .....

Title ..... Company .....

Business Address .....

.....

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 7/16,

A. Teichert & Son, Inc., 1931 Stockton Blvd., Sacramento, Calif. LB **$6,946,992** (7 bidders) grading, paving to constr. 11.5 mi. 4 lane divided freeway and 12 bridges U.S. Hy. 40 between ½ mi. east of Roseville and mi. east of Newcastle, 111-Pla-17A, Roc, B. Placer Co. CD 6/11.

▲ **Winston Bros. Co.**, 1532 California Ave., Monrovia, Calif. CA **$4,614,406.** second San Diego Aqueduct and Colorado River aqueduct canals and siphons in San Jacinto Valley to Auld Valley near Hemet, Spec. 554, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles, Calif. Bids July 1, awarded July 8. CD 7/8, under LB.

▲† **J. A. McNeil Co., Inc.**, 3115 W. Mission Rd., Alhambra, Calif. CA **$4,538,000.** SAGE technical facilities at Norton Air Force Base, ENG-04-353-58-1. SAN BERNARDINO, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids June 19, awarded July 7. CD 7/10, under LB.

▲ **Western Contg. Corp.**, 400 Benson Blvd., Sioux City, Ia. LB **$4,458,941** (4 bidders) dredging portions of Mission Bay, Crescent Bay and East Bay, DOC 573464, SAN DIEGO, CALIF. City, City Hall, San Diego, Calif. Bids July 15. CD 7/3.

BUILDINGS—LB & CA

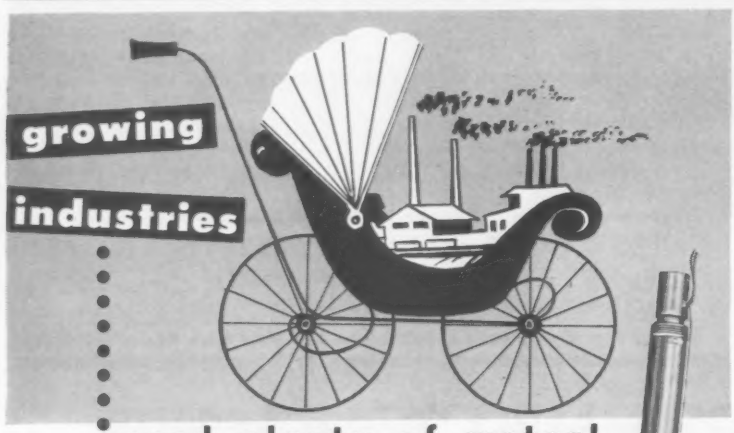
▲ **David H. Murdock Development Co.**, 3424 N. Central Ave., Phoenix, Ariz. Owner Builds. **$5,225,000.** 11 story, 174,450 sq. ft. OFFICE and private business men's CLUB, PHOENIX, ARIZ. Charles Polecek, 3424 N. Central, Phoenix, Ariz., archt. CD 2/19/57.

▲ **Hoffman Homes, Inc.**, 1800 W. Bethany Home Rd., Phoenix, Ariz. Owner Builds. **$3,500,000.** 450 HOMES, at 2 locations, in PHOENIX, ARIZ.

▲ **Morrison-Knudsen Co. Inc.**, 319 Broadway, Boise, Idaho and **L. Johnson**, 1266 Mercer St., Seattle, Wash., CA **$6,782,000**, 21 story OFFICE BLDG. 5-level PARKING GARAGE and 3 story POST OFFICE BLDG., Union St. btween 3 and 4 Aves., SEATTLE, WASH. University Properties, Inc., White-Henry-Stuart Bldg., Seattle 1, Wash. Bids May 29. CD 6/3, under LB.

▲ **Chotiner & Bumbiner**, 5316 Venice Blvd., Los Angeles, Calif. LB **$3,709,000** (7 bidders) Base Bid, constr. RESIDENCE HALL No. 2 at University of California, LOS ANGELES, CALIF. Bd. Regents, University of California, Admin. Bldg., Berkeley, Calif. Bids July 15. CD 5/21.

▲ **A. L. Branden, Branden Enterprises**, 26170 Hesperian Blvd., Hayward, Calif. Owner Builds. **$150,000,000.** 10,000 RESIDENCES, Tropicana Village with SCHOOLS, SHOPPING CENTER and parks, SAN JOSE, CALIF. David T. Johnson, 1440 Broadway, Oakland, Calif., archt.



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CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

August 13 Ontario

STREETS AND ROADS

July 29 Nova Scotia **July 30 Ontario**
August 1 British Columbia August 5 Prince Edward Island
August 13 Ontario

▲ **Ont., Uplands**—TUNNEL—BA 9/4—Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, supersonic wind tunnel, incl. manufacture and installation of supersonic nozzle and Jack Station sub-assemblies for tunnel, National Aeronautical Establishment at Royal Canadian Air Force Staton, $6,000,000.

BUILDINGS—LB & CA

▲ **Bird Constr. Co. Ltd.**, 12525 17 Ave., Edmonton, Alt. CA **$5,261,066.** FEDERAL HOUSING, federal bldg. single staff quarters, etc. R. C. Mounted Police buildings, AKLAVIK, NORTHWEST TERRITORIES. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 28, awarded July 4. CD 6/6, under LB.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Jordan and Saudi Arabia**—RAILROAD—BA 8/15—Hedjaz Railway Line, Executive Committee, Damascus, Syria, 844 kilometers section Hedjaz Ry. from Ma'an in Jordan to Medina in Saudi Arabia, $25,000,000. Brown Engineers International, 468 Madison Ave., New York 16, N. Y., U.S.A., engrs. CD 2/14.

BUILDINGS—LB & CA

▲ **Buckau R. Wolff**, West Germany, CA **$4,083,722,** liquid sugar and state syrup PLANT, IRAQ. Development Bd. and Ministry Dev. Govt., Baghdad, Iraq.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **O., Avon Lake**—Village, Village Hall, bond election Nov. 4, first portion of village sewerage system (total est. $5,994,700) **$2,750,000.** Finkbeiner, Pettis & Strout, 518 Jefferson St., Toledo, consult. engrs. CD 1/29.

AIRPORTS

▲† **Ill., Aurora**—AIR ROUTE TRAFFIC CONTROL CENTER—Civil Aeronautics Admin., Midway Air Traffic Center, 5700 S. Cicero, Chicago, 2 and 3 story, brick Air Route Traffic Control Center, near here. **$4,000,000.**

PUBLIC BUILDINGS

▲ **Calif., Berkeley**—EARTH SCIENCE—Bd. Regents, University of Calif., Admin. Bldg., plans by Warnecke & Warnecke, 111 New Montgomery St., San Francisco, earth science building on campus, **$3,837,000.** Nishkian & Nishkian, 1045 Sansome St., San Francisco, consult. engrs. CD 7/8.

▲ **Calif., Pasadena**—JUNIOR COLLEGE—Pasadena Unif. School Dist., 351 S. Hudson St., voted **$5,000,000** bonds June 3, for Junior College constr. CD 4/9.

▲ **Calif., Pasadena**—SCHOOLS—Pasadena Unif. High School Dist., 351 S. Hudson Ave., voted **$8,000,000** bonds June 3, high school constr. CD 4/9.

▲ **Mass., Springfield**—SCHOOLS—City, Dpt. P. Bldgs., City Hall, plans by Donald S. Gilman, 161 South Main St., Parker Cooley Junior High School, **$2,400,000,** Constr. late 1958, Marcus Kiley Junior High School. $2,750,000; Constr. 1959. CD 7/25/57.

▲ **N. J., Paterson**—APARTMENTS—Paterson Housing Auth., 29 Harrison Place, plans by Kelly & Gruzen, 80 Fifth Ave., New York, N. Y., apartments for elderly, incl. 100 in Cross-Mill St. area, and 100 on Peerless Plush. **$3,500,000.** Constr. early next year

▲ **N. Y., Brooklyn**—HOUSING—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by H. F. Feldman, 415 Lexington Ave., New York, Zone 17, N. Y. Proj. NY-5-34-Tilden Houses. **$15,586,000.** Bids about Nov. 25. CD 3/4.

▲ **N. Y., Buffalo**—LIBRARY—Bd. Supervs. Erie Co., County Hall, plans by Kideney, Smith & Fitzgerald, 220 Delaware Ave., and Harbach, Swain & Clark, 220 Delaware Ave., both Buffalo, main branch Buffalo-Erie Co. Library. **$8,000,000.**

▲ **O., Ashland**—SCHOOL—Ashland Bd. Educ. plans by Fulton, Delamotte & Assocs., 6014 Euclid Ave., Cleveland, high school. **$3,355,000.** CD 9/28/56.

▲† **Tenn., Oak Ridge**—WEAPONS FABRICATION PLANT—Atomic Energy Comn., P.O. Box E, Oak Ridge, weapons fabrication plant. **$12,500,000** (no appropriation).

▲ **Tex., Birdville**—SCHOOL—Birdville Ind. School Dist., voted bonds June 28, constr. 4 elementary schools, Junior High School and Senior High School. **$4,500,000.**

COMMERCIAL BUILDINGS

▲ **Ark., Siloam Springs**—UNIVERSITY IMPRVS.—John Brown University, Bd. Trustees, imprvs., incl. engi-

neering dept., student housing for 600 men and women, conversion of Alumni Bldg. to Student Union Bldg., remodeling gymnasium. $3,000,000.

▲ **Calif., Berkeley**—HOTEL EXPANSION, etc.—Claremont Hotel, c/o Mgr., Claremont Hotel, plans by Angus McSweeny, 612 Howard St., San Francisco, 8 story hotel addn., incl. swimming pool, skating rink and patio. $2,000,000. CD 1/3.

▲ **Conn., Hartford**—STORE—G. Fox & Co., 960 Main St., dept. store addn., bridge over street. $5,000,000. Abbott, Merkt & Co., 10 E. 40 St., New York, N. Y., consult. engrs.-archts. CD 7/12/56.

▲ **Conn., Stamford**—APARTMENT—First Stamford Corp., 1222 Main St., apartment, Bedford St. $5,000,000. CD 5/29/51.

▲ **Ind., Greenfield**—HOMES—Bob Lain Contractor, Inc., 209 (1,060 sq. ft. each) homes, all city utilities, incl. paved streets and sewers, State Rd. No. 13 and McKenzie Rd., all in 66½ acres. $4,500,000.

▲ **Ind., Indianapolis**—HOMES—Jas. E. McNamera Constr. Co., 1112 Kessler Blvd. E. Dr. 200 homes, 144th St., 1 mi. W. of U. S. Rd. 31. $5,000,000.

▲ **Ind., Indianapolis**—HOUSING—Community Homes, Inc., Whiteland, housing, New Whiteland, U. S. Rd. 31, 12 mi. S. of here. $2,400,000.

▲ Ind., Plainfield—HOUSES—S & W Builders, 210 Holiday Dr., 120 masonry houses, sanitary and storm sewers, curbs and sidewalks and black top streets, St. Lukes addn., Brentwood Heights. $2,000,000.

▲ **Md., Baltimore**—HOSPITAL, etc.—Franklin Square Hospital, Franklin Square, plans by Cochran, Stephenson & Wing, 925 N. Charles St., Zone 1, hospital on 41½ acre tract on Old Philadelphia Rd. near Rte. 40 and Beltway; plans by Theodore Glidden, Equitable Bldg., Zone 2, student nurses dormitory. Total $8,000,000. Gordon, Friesen & Assocs., 1145-19 N.W., Wash., D. C., consultants. CD 12/24.

▲ **N. Y., Amherst**—HOMES—Engasser Bldg. Corp., 50 Norman Ave., Eggertsville, 200 ranch homes on 52-acre tract, Sheridan Dr. $5,000,000.

▲ **N. Y., Amherst**—HOMES, etc.—Giller Associates, Inc., 1500 Bertel Ave., 500 homes and shopping plaza. $9,000,000.

▲ **N. Y., New York**—APARTMENT—William R. Buxbaum, c/o Sylvan Bien, archt., 36 W. 46 St., Zone 19, 19 story apartment, Lexington Ave. from 71 to 72 Sts. $4,000,000.

▲ **N. Y., New York**—OFFICE—Dewey Carver, 299 Madison Ave., plans by Emery Roth & Sons, 575 Madison Ave., Zone 22, 25 story office, at southwest corner Church and Murray Sts. at 116-120 Church St. and 38-58 Murray St. $12,000,000.

▲ **N. Y., New York**—SCHOOL, etc.—Columbia University, 116 St. and Broadway, Zone 27, plans by Moore & Hutchins, 800 Second Ave., Zone 17, 8 story bldg. for Graduate School of business on campus on site of present University Hall, $5,000,000; plans by Slingerland & Booss, 120 Grenwich St., New York 6, N. Y., renovation of apartment, 431 Riverside Dr. and 115 St. for student families, $600,000. CD 3/29/56.

▲ **N. Y., New York**—APARTMENT—Alfred Kaskel, 12 E. 48th St., Zone 22, plans by Sylvan Bien, 36 W. 46 St., Zone 19, 20 story apartment, 180 East End Ave. $5,000,000.

▲ **O., Dover**—SHOPPING CENTER—Lemley & Welsh Realty, 115½ Park Ave. W., Mansfield, 22 store shopping center, Union Ave. $2,000,000.

▲ **O., New Philadelphia**—SHOPPING CENTER—M. De Bartolo Constr. Co., 2620 Market St., Youngstown, Twin City Plaza 25-unit, 145,000 sq. ft. shopping center, 12th and College Sts. $2,000,000.

▲ **Pa., Phila.**—HOMES, SHOPPING CENTER, etc.—Hampton Holding Co., c/o Heyman Korman, Inc., 6401 Castor Ave., 1,600 C-1 pattern row homes, shopping center and recreational facilities at Byberry and Dunks Ferry Rds., $20,000,000. Constr. 1959.

▲ **Tex., Texas City**—SHOPPING CENTER—O. B. Scribner & J. C. French, Texas City, shopping center. $3,000,000.

▲ **Wash., Spokane**—SHOPPING CENTER—Brown Bros., Realty Div. of Brown & Holter Motor Co., Colfax, shopping center, Wellesley Ave. between Belt and Alberta Sts. $3,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Whittier**—FACTORY—Eastman Kodak Co., 470 S. San Pedro St., Los Angeles, plans by Daniel, Mann, Johnston & Mendenhall, 3325 Wilshire Blvd., Los Angeles, 125,000 sq. ft. factory, Slauson Ave. and Byron Rd., $2,000,000.

▲ **Conn., Clinton**—MANUFACTURING PLANT—Chesebrough-Ponds, Inc., 485 Lexington Ave., New York, N. Y., plans by A. M. Kinney, Inc., 60 E. 56th St., New York, N. Y., 1 story plant addn. wing to production bldg., boiler house, laboratory, warehouse, railroad dock. $2,500,000.

▲ **N. J., Elizabeth**—WAREHOUSES, etc.—Wakefern Food Corp., 715 South Ave. E., Cranford, 6 warehouses, food distribution and offices, York St. $3,500,000. CD 5/6.

▲ **Okla., Laverne**—PLANT—Sun Oil Co., Petroleum Bldg., Tulsa, casinghead gasoline plant to handle 100 million cu. ft. of wet gas per day. $3,000,000. Refinery Eng. Co., 108 N. Trenton, Tulsa, consult. engr.

(Proposal Advertisement see pp. 86 to 88)

These forms tied in 5 minutes by two men... in less than 10 minutes by one man.

Stripped in moments by one man. No form clamps to move.

Stripped form is smooth, no bulge. Saves finishing time.

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The Signode way reduces costs by as much as 33% in strapping forms for concrete columns and bridge piers. On this job, the forms for each floor were built in a central location, strapped in 5 minutes each, and lowered to the floor below over the reinforcing rods.

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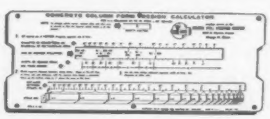

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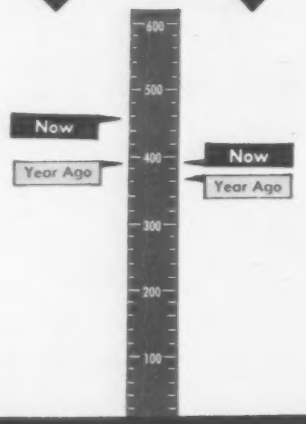
Construction Scoreboard

ACTIVITY THIS WEEK

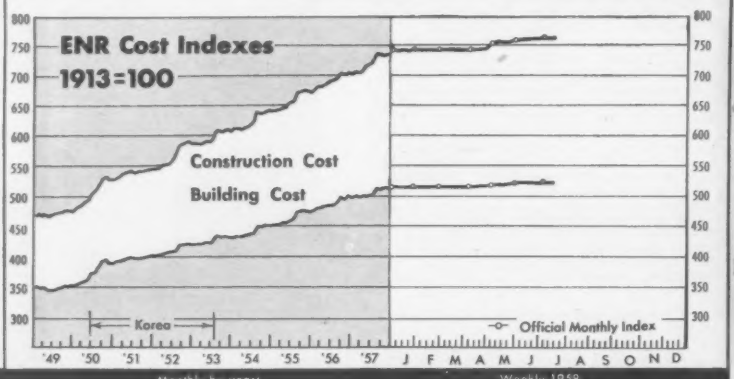
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR Indexes (1913=100, 20-cities' Average	Week of Jul. 17 1958	% Change from Jun. 19 1958	% Change from Jul. 18 1957
Construction Cost	763.50	+0.7	+3.5
Building Cost	524.68	+0.5	+1.7

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



AMOUNT OF CONTRACTS LET

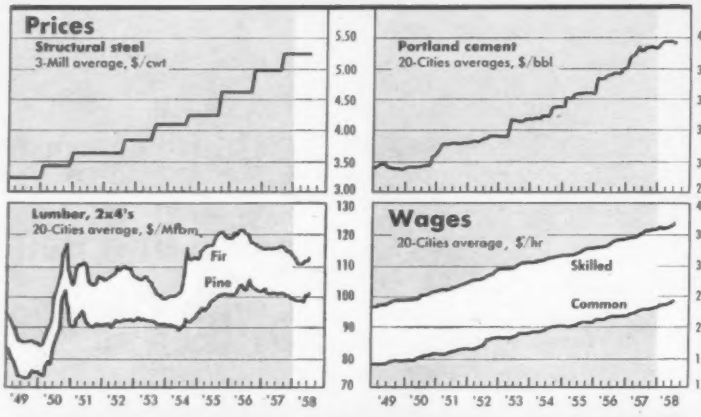
By Ownership	This Week millions	Cum. 30 wks 1958	Chge '57-'58 %
All Heavy Constr.	$455.4	$11,841.9	+7
Private	152.6	4,948.5	−2
Public	302.8	6,893.4	+15
State & Municipal	224.9	4,860.2	+12
Federal	77.9	2,033.2	+23
By Type of Work			
Public			
Waterworks	23.2	192.8	−11
Sewerage	10.7	353.1	+6
Bridges*	38.4	416.6	−4
Highways	76.4	1,882.2	+3
Earthwork, Waterways	38.6	718.6	+8
Buildings, Excl. Housing	66.3	1,566.9	+17
Housing	10.9	857.0	+108
Unclassified	38.3	914.8	+22
Private			
Mass Housing	66.9	2,318.5	+30
Commercial	28.6	1,123.5	+8
Industrial	52.1	1,233.9	−37
Unclassified	5.0	264.0	−3

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

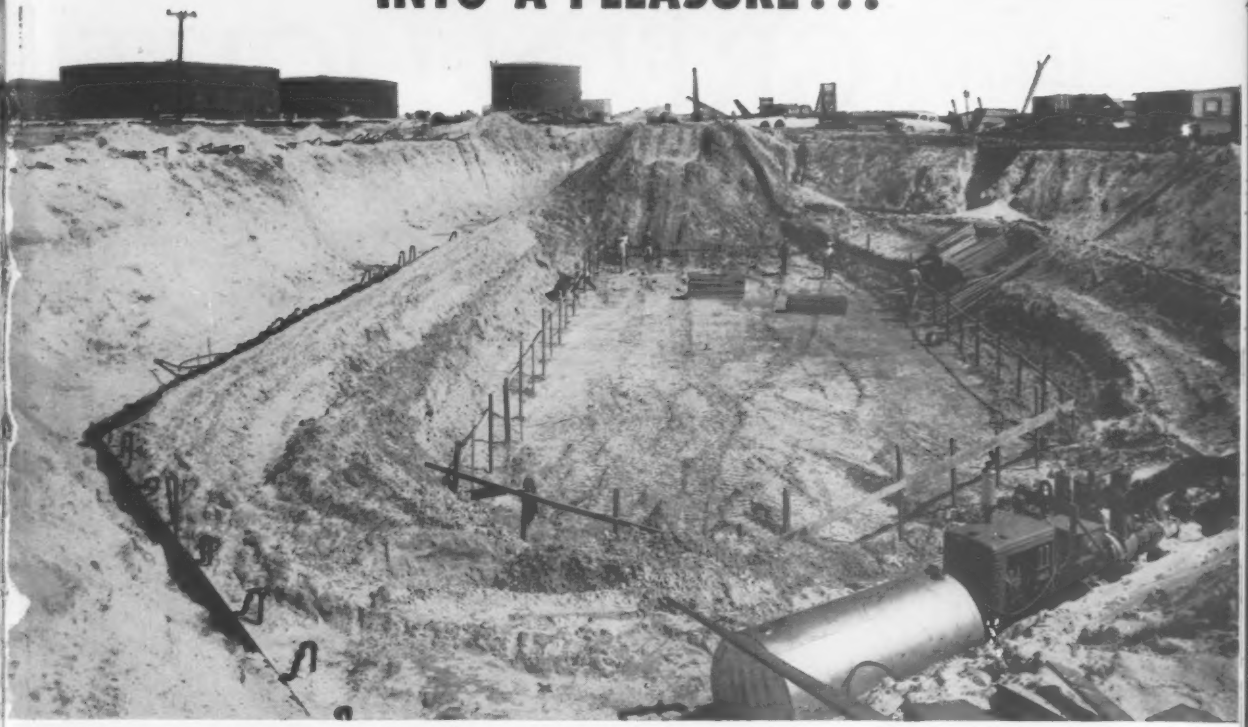
	Week of July 17 millions	Cum. 29 wks 1958	Chge '57-'58 %
Corporate Securities	$343.0	$3,308.9	−4
State and Municipal:			
All Except Housing	120.1	3,835.8	+28
Housing	...	33.8	−78
Federal Loans	...	110.1	−27
Federal Aid	...	.....	−100
Total Nonfederal	$463.1	$7,288.6	−18
Federal Appropriations:			
Projects in U. S.	$2.1	$849.5	+105
Outside U. S.	1.0	6.3	−72
Total New Capital	$466.2	$8,144.4	−13

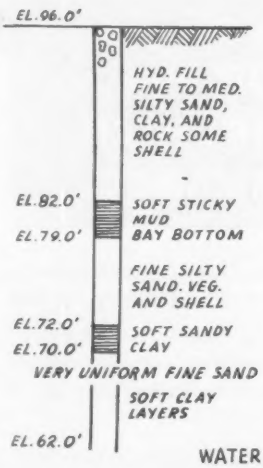


ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost July 1958	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost July 1958	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	568	+1.8	+8.7	467	+1.2	+5.5
Baltimore	701	0	+5.7	527	0	+3.1
Birmingham	593	0	+6.8	480	0	+5.1
Boston	795	+0.2	+6.4	533	+1.0	+2.8
Chicago	839	+0.1	+1.0	541	+1.1	+3.4
Cincinnati	771	+3.4	+3.4	507	+1.0	+1.6
Cleveland	868	+2.2	+1.4	521	+1.2	−0.1
Dallas	568	+2.7	+8.2	462	+0.5	+5.2
Denver	725	0	+3.2	525	0	+2.8
Detroit	853	+0.1	+3.6	555	+1.8	+3.0
Kansas City	762	0	+3.7	527	0	+4.4
Los Angeles	816	+0.3	+11.6	516	+0.4	+3.1
Minneapolis	818	0	+4.8	548	0	+3.3
New Orleans	592	+0.2	+3.6	477	+0.1	+2.2
New York	934	+2.4	+9.7	603	+0.4	+4.5
Philadelphia	795	0	+2.0	569	0	+1.6
Pittsburgh	821	+0.3	+7.9	581	+1.4	+7.3
St. Louis	843	+0.4	+6.9	562	+0.6	+4.4
San Francisco	798	0	+5.2	511	+0.7	+4.1
Seattle	789	0	+5.1	474	+0.7	+3.5
U. S.—20 Cities' average	763	+0.7	+5.3	524	+0.6	+3.5
Montreal	603	0	+2.8	449	0	−0.4
Toronto	604	−0.3	−1.0	469	+0.1	−0.3

MORETRENCH WELLPOINTS CHANGE A PROBLEM INTO A PLEASURE...





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From past experience on an intake well in the same area they knew that the quickest, most economical way to handle water was to install a topnotch wellpoint system. Twenty days after pumping started, the job was excavated to subgrade—in the dry.

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When business slows . . .

How to Get New Contracts

- **Harder selling. It's taking on more importance for some contractors who are moving ahead**
- **Other markets. If your specialties are slowing down, look around. Some fields are expanding**

Getting more business in a period of economic decline has been a top problem for all of industry. And some contractors also experienced the economic squeeze, although the dynamic recovery in all heavy construction contract awards is now apparent.

But those who intensified sales efforts and struck out at different markets are in a front position to pick the new crop of contracts as their reward.

They accomplished this by appraising the market, equipping themselves to obtain the type of business available and then selling prospective clients on their ability to do the job economically. Those in public works came in with low bids.

To find out what contractors are doing to build business ENR surveyed a number of companies, both large and small.

• **Diversification**—This has been among the most common moves among the firms checked by ENR. It's a strategy adopted by smaller companies, as well as the giants in the construction field. "Diversification" really means "going after business where business is being done."

Backing this principle are accelerated and increased sales efforts, incentive plans for employees, and cost-reducing practices. But whatever the method or combination of methods adopted, selling is the prime tool. And in many cases it's paying off with improved volume during a more demanding era of business.

• **Saw it coming**—Among the examples of firms that grabbed hold of the problem is M. W. Kellogg Co. of New York City. During a boom period, executives looked ahead and spotted a cloud on the industrial building horizon. They laid plans accordingly—first publicly—announced result of their planning was establishment of a new Division of Industrial Projects (ENR May 22, p. 99).

Now the firm handles designing and construction for all types of process industries. Formerly it concentrated in the petroleum and petrochemical fields. Within those industries, it placed emphasis on the areas where it had developed a process.

The division is being backed with a sales campaign, including new ideas, research, new methods and the promise of economy for the client.

• **Spend money to make money**—In moving to a stronger competitive position, Kellogg pushed for economy within its own organization, but it did not cut its staff. On the contrary, new people were added and Kellogg still is enlarging its sales engineering group.

However, most of the engineering staff is becoming more sales-conscious. The firm's process engineers are sent to refineries to spot better ways of conducting an operation. If a plant is not as economical as it could be, or if another method of reaching a desired end-product is available, the owner is informed. Selling begins then and M. W. Kellogg has learned that often you can get the contract when the owner is convinced he can save money with a newer operation, despite the capital outlay required.

• **Field economies**—To deliver a job at lowest possible cost, the company must take stock of its own operations. Among the basic cost problems are labor productivity in the field and tooling a job site.

To get more productivity, Kellogg has a man on special assignment. He makes sure the company is using the most efficient methods of planning and scheduling work operations. He also studies each construction operation for economy and speed.

The company also has initiated a new system of assigning its young engineers to construction crews. Company officials refer to the plan as "integrating the white collar with the blue collar."

The young engineers do not supervise work crews. But they do think ahead for the workers, keeping a list of the materials and men that will be needed to complete an operation. This cuts the amount of time and money lost when a crew has to wait for materials, and equipment for the completion of an operation.

Another group in the organization works at ways to reduce the amount of investment per man in the field. Objective is to lower the amount of tooling on a job, without sacrificing speed, efficiency and economy. One Kellogg executive says, "It boils down to having one machine do four jobs instead of four machines doing four jobs."

The wide range of efforts by Kellogg form one big weapon—sales ability.

• **Strong markets**—These include public buildings, exclusive of housing and public housing (including "Capehart"). In private work, commercial is ahead of last year, along with mass housing. Also up are highways, sewerage and waterways and earthwork.

One of the large potential business opportunities for contractors is urban renewal. The machinery is established and both federal and in many cases community funds are available to get a project rolling.

This market, however, has been left primarily to real estate development companies. Contractors work for them in urban renewal construction but firms generally have not taken on the job of putting together a redevelopment package, which it then builds.

But look at F. H. McGraw and Co. of Hartford, Conn. Clifford S. Strike, president, and other officials of the company, looked at urban redevelopment and decided to go after it. They started at home base—Hartford—and in competition with three other firms negotiated with city and redevelopment officials there. A thorough presentation was prepared. Then it was personally presented by Mr. Strike to agency and governmental officials during a question-and-answer session.

Result: The McGraw firm was selected to start work on Hartford's first redevelopment project with an ultimate estimated cost of $60 million, including both private and public investment. It will be entirely commercial, with no housing involved.

• **Other prospects**—Urban renewal is

PRESIDENT WINS $60 MILLION JOB. Clifford S. Strike (center), of F. H. McGraw and Co. explains to urban development officials of Hartford, Conn., why his firm is best fitted to take over the city's first development site. The sales presentation and lengthy question and answer session were fruitful. McGraw was selected over two real estate developers and another contractor.

not the only area McGraw plans to enter. It is willing, prepared, and able to push into public works, a field it was in before it was caught up in the industrial building boom. McGraw also has submitted at least one bid for a waste treatment plant.

• **Bigger sales force**—After pinpointing the areas where business is being done and sizing up a project that is a contract candidate, any company has to make itself known. Contacting potential customers is a "must."

So McGraw has bolstered its regular new business staff by transferring about 15 engineers to the sales staff as contract engineers.

In general, the engineers assigned to this task are those that have a wide range of experience in the building field and are sales-minded.

They've been put to work under company executives in New York City, Chicago, Hartford and Pittsburgh—where McGraw has offices. Their job is to contact manufacturing companies, architectural and engineering firms, and local government officials. The approach, both personal and by mail, aims at selling new construction, modernization or rehabilitation.

Few opportunities are overlooked and the smallest lead or possibility is checked out. When a promising new product is announced a McGraw representative visits the producer to see if a new plant or an addition is needed to manufacture the new product in volume.

• **Public relations**—The company also has stepped up its public relations and advertising program to build company identification.

Mr. Strike believes that more company recognition can lead to or bring business that otherwise would be missed. One method adopted to arrive at this objective is increasing the circulation of the company magazine. This 16 page, two-color publication now is mailed to 10,000 engineers and executives of manufacturing companies.

McGraw officials say the magazine is "an excellent show case for the company because it graphically records our construction accomplishments."

• **Smaller firms awake too**—Progressive and aggressive business methods aren't limited to the largest firms.

One example is Charles D. Smith & Son, Inc. of Fond du Lac, Wis. Officials report that changes in personnel policy and updated equipment are bringing a "competitive edge."

The company started a profit-sharing plan for all employees with service of five years or more. It is also reviewing employee wages semiannually.

Key personnel are fully informed and instructed on job responsibilities, wage regulations, equipment inventory and rental rates, equipment maintenance, job office expenditures and reports.

Each month, key employees meet at the main office for full-scale discussions on subjects like these.

• Future labor and equipment requirements for each job.

• Improvement of equipment on hand and purchases of new equipment.

• Cost-reducing construction methods.

• Personnel advancement and changes.

• Prospective new work.

A regular program of equipment maintenance, including on-the-job inspections by the chief mechanic, is followed. There's also a status chart for subcontracts. This is used by estimator-purchasing agents to record for each job the dates of each operation performed. It also serves to keep management posted on progress toward on-schedule material deliveries and subcontract installations. The method works hand-in-hand with a cost accounting operation.

In Miami, Fla., a contractor has a cost accounting system that gives a day-to-day check on the cost of work done. Reports from the job are mailed daily to the main office. They're studied daily; tabulated weekly and monthly. (Dun & Bradstreet reports that many contractor failures result from poor management and the lack of proper cost accounting procedures.)

Business Briefs . . .

• **Building ahead in Chicago**—During the first half of 1958, construction of all types in Chicago was 9.8% ahead of 1957's first half, says Myron G. Fox, president of Bell Savings and Loan Association. Total for the six months: $592.5 million this year, $539.6 million last year.

• **Armour expands**—Schmidt, Garden and Erickson, Chicago architects, will design a multi-million dollar chemistry and chemical engineering building for Armour Research Foundation in Chicago. The structure is the third unit in a ten-year expansion program.

• **LA rental building**—Tishman Realty & Construction Co. will build a 22-story rental office structure in downtown Los Angeles. President Norman Tishman says it is the first building for general leasing erected in that city since World War II.

• **Utility to sell bonds**—Southern California Edison Co. will put $50 million in bonds on sale August 25. Proceeds will be used primarily for the company's construction program.

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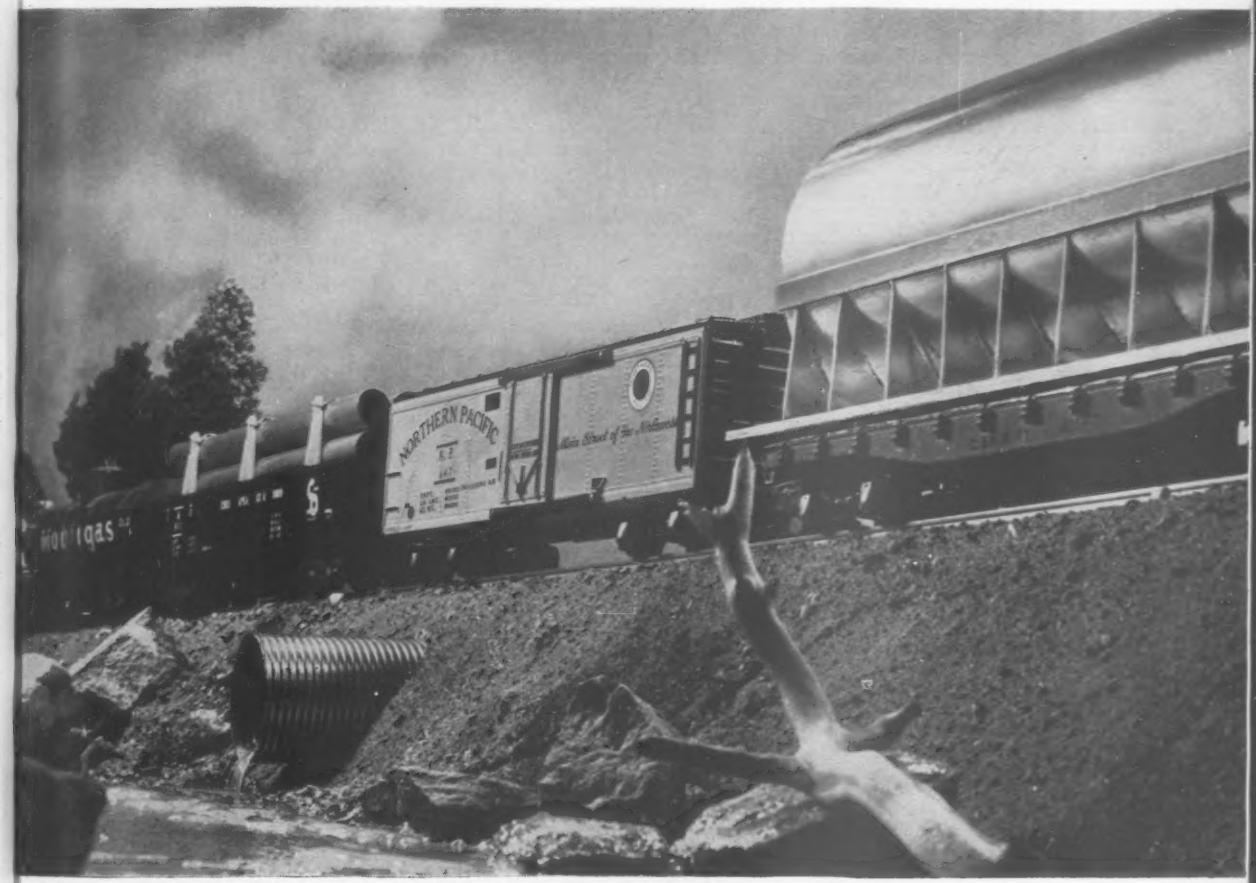
use Corrugated Metal

Corrugated Metal Drainage Structures are *flexible.* A flexible structure deflects under load and gains support from the "passive resistance" of the compressed soil around its sides. That's why it can stand the crushing weight of deep fill and the vibration and impact of heavy loads over shallow fill. Metal drainage products, excellent in all applications, are particularly suitable when the height of earth cover is shallow, or more than 25 feet—in fact, some specifying agencies *require* metal structures under these conditions.



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Labor Unity: At a Crossroads

AFL-CIO may drive a wedge in the building trades if it outlaws mutual assistance pacts with the teamsters

AFL-CIO unions are confused and confounded. They don't know what the federation's rules on dealing with expelled unions really mean—particularly when it comes to the International Brotherhood of Teamsters.

But they do know the issue is going to spell trouble soon. And particularly within the powerful building trades bloc of the AFL-CIO, to which the teamsters once belonged. Before it's over, some craft unions could be out of the giant labor federation and this could give construction labor relations quite a new complexion.

Concern over the growing problem was evident this week in an attempt by the AFL-CIO weekly paper—"The AFL-CIO News"—to explain federation President George Meany's explanation of the rules last week.

Mr. Meany was asked to clear it all up because more and more affiliates of the AFL-CIO are signing mutual aid pacts with the teamsters. One of the first, out of the dozen or so now running, was the four-way organizing-jurisdiction pact for heavy and highway construction between the teamsters, carpenters, operating engineers and laborers. This was signed before the teamsters' ouster on corruption charges.

• **The seeds of trouble**—President Meany, in a shipboard interview on his return from Europe, indicated that any AFL-CIO unions with teamster pacts that help strengthen the truck union face ouster themselves. He didn't say what unions these might be.

The "AFL-CIO News" followed up the comment this week in an editorial. It says that Mr. Meany meant this: "Any alliance of the AFL-CIO affiliates with organizations expelled from the federation must meet the test of whether or not they're in conformity with the spirit and wording of the AFL-CIO constitution."

It was the constitution that started the confusion in the first place. It says no affiliate shall allow "representation or recognition" to an expelled union on the penalty of expulsion itself. But when the teamsters were kicked out, neither Mr. Meany or anybody else attempted to break up AFL-CIO union pacts with the teamsters.

Now, this policy has come home to roost, for two special reasons:

• Teamster President James R. Hoffa is forming a permanent conference of transport unions to settle jurisdiction, organizing and other mutual problems. A charter member is an AFL-CIO affiliate, Joseph Curran's National Maritime Union. Dozens of other union affiliates are being invited to join.

Mr. Curran is a vice president of the AFL-CIO and a member of the Executive Council and the Ethical Practices Committee. He was asked whether he violated the AFL-CIO constitution in signing the transport pact with Mr. Hoffa's teamsters. "I don't know what the constitution says," he answered.

• The case of carpenters' President Maurice A. Hutcheson is coming to a head. Mr. Hutcheson and several other officers of the influential craft union declined to tell the McClellan investigating committee whether they used union money in an Indiana land-buying scheme against the state, and they're now called on the AFL-CIO carpet. (Mr. Hutcheson's union is one of the building trades that supported the teamsters at the time of the ouster action.)

Mr. Meany says both matters are the first order of business at next month's meeting of the AFL-CIO Executive Council.

• **A dilemma**—Since the federation first failed to act against those unions dealing with the expelled teamsters, there have been some bleak attempts at defining policy. One supposed rule is that agreements with teamsters may continue at the local level. But in almost all cases, including the four-way pact, the terms, the funds and frequently the strategy is worked out at international headquarters.

The matter probably wouldn't have come to a head but for Mr. Hoffa's promotion of pacts with the teamsters. The AFL-CIO can no longer ignore the intrusion of the giant trucking union, but it also recognizes that it's the teamsters powerful position that leads to the alliances in the first place.

Mr. Hoffa has been more than delighted at forcing President Meany's hand. The AFL-CIO president insists that the grounds for teamster purity is removing Mr. Hoffa from office. This is as unlikely as getting most AFL-CIO unions to end their agreements with the teamsters.

Business Condemns Labor Bill

Organized business opened a broadside attack last week against the labor reform bill now before Congress.

The Kennedy-Ives bill was described as defective in both its inclusions and omissions by the U. S. Chamber of Commerce and the National Association of Manufacturers. The organizations are firmly opposed to sending the bill to the floor of the House without first going through the normal procedure of having a full-scale committee hearing.

Biggest objections registered against the bill are these: As it now stands, the bill contains a lot about which "the public is not being told"—the "harmful" Taft-Hartley amendments tucked away in Title VI. It "does nothing about protecting neutrals from the evils of secondary boycotts and would not correct organization and recognition picketing abuses."

The bill, largely designed to protect union funds and to promote union democracy, was passed by the Senate on June 17 and has since been on the desk of House Speaker Sam Rayburn. He may try to bypass the House Labor Committee and send it directly to the House under suspension of the rules.

The Chamber of Commerce says bypassing the committee would be "hasty action" that could result in writing "into the law mistakes that will do irreparable harm."

One of the chamber's objections to the bill is that it would legalize the prehire contract in the construction industry. Indirect result of this is to "restore the closed shop," says the chamber.

Exception is also taken to those provisions that would enlarge the jurisdiction of the National Labor Relations Board at the expense of the states, allow economic strikers to vote, require non-Communist affidavits from employers and compel employers to report all "activities designed to win (employee) loyalty and goodwill."

Union Shop Fight Helps Labor

Current efforts to ban the union shop are beginning to boomerang. Organized labor is apt to emerge as the long-range victor after the November elections, which will test the issue in at least five states.

Such a possibility is indicated by the way the present right-to-work campaign is promoting the interests of labor in two respects:

• It's giving labor the type of cause that's long been needed to arouse the union interest essential to effective political action.

• It's affording an unusual opportunity for labor to enlist the help of others in selling the trade union movement to the general public.

(Right-to-work laws accomplish the open shop by making it illegal to impose union membership as a condition of employment. And in the construction industry the open shop has long been a source of labor strife. For many years, repeal of the Taft-Hartley Act's Section 14 (b), which gives states permission to pass right-to-work laws, has been a principal legislative aim of the AFL-CIO building trades. Such laws not only nullify the present 30-day union shop clause, but they would also outlaw the pre-hire contract now proposed for construction unions in the Kennedy-Ives labor reform bill.)

• **A good example**—One of the best examples of what is happening on the right-to-work front is taking place in California.

There the building trades unions have joined with other labor organizations in two big campaigns:

• An "all out" voter registration of union members. The purpose is to defeat the right-to-work initiative that will be on the state's November ballot.

• An educational campaign to alert union members to the union-busting nature of such legislation and to convince the public that a strong union movement is essential to the nation's industrial peace and economic prosperity.

At the same time, the Director of the California State Department of Industrial Relations has come out against the right-to-work proposal.

The California labor activity is far from a two by four operation. The California State Federation of Labor has announced the hiring of a political research firm to help set the compass for labor's political activity. And a public relations firm has been hired to direct what is known as the Citizens' Committee for the defeat of the right-to-work proposal.

• **The national scene**—The picture is about the same here. The AFL-CIO Committee on Political Education looks forward to a banner year. "We expect to exceed past records as far as registration, money raising and electing friends of labor to office," it says. It attributes this to the threat of repressive legislation and to the economic recession.

COPE area conferences are showing more union interest than ever before and labor's best results in primaries have been in states where the right-to-work issue has been raised. Sen. William Knowland's poor showing in the California gubernatorial primary is an example.

And now organized labor, which has already won the anti-right-to-work support of many religious leaders and the National Association for the Advancement of Colored People, has a new ally.

It's the National Council for Industrial Peace, now the only counterpart of the National Right-to-Work Committee. The council was formed this month to protect "the nation's economy and the working man's union security from the predatory and misleading campaigns" being waged to extend right-to-work legislation. Mrs. Eleanor Roosevelt and former Sen. Herbert H. Lehman (D.-N.Y.) are co-chairmen.

In firing their first salvo against right-to-work laws, council sponsors had this to say:

"The fact is that these laws do not guarantee any right to work. They are clearly and solely aimed at weakening the trade union movement and thus weakening the basic economy of the United States, which is built on mass consuming power. . . . They are clearly injurious to industrial peace."

• **The battleground**—In the absence of any immediate possibility of amending the Taft-Hartley Act to kill right-to-work laws, the fight will be waged by labor at the state level.

Right-to-work proposals are assured a place on the November ballots in California, Kansas and Idaho.

Petitions with enough signatures to qualify similar proposals for the November elections have been filed in Colorado and Washington.

Right-to-work supporters seem likely to achieve the same results in Ohio, where the filing deadline is August 5.

OFFICIAL PROPOSAL

Bids: July 30, 1958

Advertisement for Bids
City of Binghamton, New York
Construction of
Sewage Treatment Plant

NOTICE IS HEREBY GIVEN that sealed proposals will be received by the Board of Contract and Supply for:

CONTRACT NO. 1
GENERAL CONSTRUCTION

The work to be performed under this Contract provides for the general construction of a primary sewage treatment plant. The work includes the following principal features:

(a) Head house consisting of a brick faced masonry superstructure on a concrete substructure. The head house will house the administrative offices, laboratory, main pumping station, sewage screens, sludge filtering equipment, chemical storage space, garage and shop.

(b) Two concrete grit removal chambers equipped with mechanical scrapers, and a grit house for housing the grit washing equipment.

(c) Chlorine feed house for housing the chlorinating equipment, with adjacent facilities for storing chlorine containers.

(d) Concrete settling basins, with facilities for mechanical removal of scum and sludge. Appended to this structure is the raw sludge pumping station and the chlorine contact tank.

(e) Two sludge digester tanks between which is located a sludge control building. The tank walls will be constructed of brick faced prestressed reinforced concrete, with a steel frame roof and will contain the necessary sludge digestion equipment. The control building will be of similar construction as the head house, and will house the sludge digestion control equipment.

(f) Approximately 650 feet of concrete pipe interceptor sewer together with manholes and regulator chamber.

(g) All operating equipment and facilities shown on the Drawings, and specified, except that plumbing, heating and ventilating and electrical work will be provided for under other contracts.

(h) All related work, including grading, planting, paving, and other miscellaneous work.

Sealed bids for the above described work will be received by the office of the Board of Contract and Supply, in the Council Chambers, City Hall, Binghamton, New York until 10:30 A.M. (EDST) on July 30, 1958, at which time and place said proposals will be opened and read aloud.

Drawings, Specifications, Instructions to Bidders, Proposal and forms of Proposal Bond, Contract and Performance Bond may be examined at the office of the Board of Contract and Supply, City Hall, Binghamton, and at the office of Parsons, Brinckerhoff, Hall & Macdonald, Engineers, Sanitary Department, Room 602, 55 Broadway, New York, New York. Copies may be obtained at the office of Parsons, Brinckerhoff, Hall & Macdonald, Engineers and at the office of the Board of Contract and Supply upon deposit of twenty-five dollars, which sum will be refunded upon return of the Drawings and Specifications in good condition within sixty (60) days after the opening of Bids.

Proposals must be submitted on the Form furnished by the City and shall be accompanied by a Bid Security in the form of an acceptable proposal bond or a certified check in an amount not less than five percent (5%) of the total Bid. Said deposit will be held by the City subject to the requirements set forth in the Information for Bidders.

The successful Bidder will be required to furnish a satisfactory Performance Bond in the amount of One Hundred percent (100%) of the accepted bid.

The Board of Contract and Supply reserves the right to reject any or all bids and to waive any informalities therein.

William G. Emmons
Board of Contract & Supply
City of Binghamton
By: William Emmons, Secretary

Dated July 2, 1958

(Continued on following page)

OFFICIAL PROPOSALS

Bids: August 7, 1958

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of AUGUST, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Montgomery	US 98	Lock 16 Erie Canal Near St. Johnsville	....	Furnishing & Installing 2 Lock Gates & Lowering Sills	5% of Bid Plans $10	Confidential
Oneida (Rte. 49)	FARC 58-96	Mohawk River Road Marcy, S.H. 296 Project DF DU 518(5)	2.27 (0.66 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Wide = 2.18 Mi. Asph. Conc. Ty. 1A = 0.66 Mi. Misc. Work = 0.09 Mi.	$70,000 Plans $5	$1,211,000
DISTRICT No. 3, E. E. TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga	FIC 58-13	Interstate Route Connection No. 570 (City of Syracuse: State Fair Boulevard) Project I 1139(2)	1.25 (0.84 Acc.)	Electrical Lighting Facilities	$4,500 Plans $2	83,000
Oswego (Rtes. 11, 3, 126, 104, 49, 13	RC 58-92	Twenty Two Various State Highways in District No. 3	....	Roadside Development	$500 No Plans Prop. Only $2	9,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie (Rte. 130)	FAGC 58-12	City of Buffalo: Broadway Arterial Highway (N.Y.C. R.R. & D.L. & W. R.R. Grade Separations Project UG 285(3)	0.39	9" Cem. Conc. Pavt. 2 @ 30' Wide R.R. Sep. I Beam 117.5' Variable R.R. Sep. Pl. Girder 92.5'	$128,000 Full Size Plans $50	2,335,000
Niagara	PSC 6607	Elimination of Grade Crossings of New York Central Railroad & The Erie Railroad With Roads & Streets in City of Niagara Falls	5.12 (0.94 Acc.)	R.R. Relocation = 5.12 Mi. Cem. Conc. Pavt. = 0.59 Mi. Asph. Conc. = 0.25 Mi. Grav. & Bit. Mac. = 0.10 Mi. 4 Hy. Segs. Pl. Gird. 115.7', 77.2'; 112.8' & 149.8' 1 Reinf. Conc. Arch Br. 30'	$205,000 Plans $10	3,747,000
Niagara	FABS 58-8	Robinson Road Pt. 2, Co. Rd. 123 Project S 528(1)	1.02	Asph. Conc. = 0.94 Mi. Misc. Work = 0.08 Mi.	$11,000 Plans $2	192,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 17)	TC 58-1	Corning Painted Post, S.H. 5026 (Centerville Road Intersection)	0.03	Traffic Signal	$600 Plans $2	10,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Jefferson (Rte. 12E)	FARC 58-103	Cape Vincent Watertown, Pt. 2, S.H. 1164 Project F 565(3)	1.51	Asph. Conc. Ty. 1A = 1.45 Mi. Misc. Work = 0.06 Mi. Comp. W. F. Beam Br. 507.8' Precast Conc. Beam Br. 32.2'	$60,000 Plans $5	1,120,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Orange (Rte. 17)	FARC 58-94	Tuxedo Harriman Pt. 2, S.H. 8256 Central Valley Turners, S.H. 115 Project DF 405(8)	4.51	Asphalt Concrete	$25,000 Plans $2	458,000
Orange (Rte. 9W)	FARC 58-99	Balmville Newburgh, S.H. 1538 Newburgh Cedar Hill Cemetery, S.H. 5007 Project DF 357(10)	2.84	Asphalt Concrete	$9,300 Plans $2	168,000
Orange (Rte. 293)	FARC 58-95	West Point Central Valley S.H. 5328, 5328A, 5328B Project S DA	3.81	9" Cem. Conc. Pavt. 22' Wide = 3.67 Mi. Misc. Work = 0.14 Mi. Reinf. Conc. Arch Bridge 22'	$73,000 Full Size Plans $15	1,338,000
Orange, Ulster & Westchester (Rtes. 94, 17K, 9W, 312, 55, 212, 100, 22, 6)	RC 58-96	Br. No. 1 S.H. 154; Br. No. B 1 S.H. 576; Br. No. B 2 S.H. 8500; Br. No. B 1 S.H. 8536; Br. No. B 2 S.H. 8536; Br. No. 1 S.H. 602; Br. No. 2 S.H. 603; Br. No. 3 S.H. 1882; Br. No. 1 S.H. 1324; Br. No. B 2 S.H. 5298A; Br. No. 1 S.H. 3297	....	Cleaning & Painting 11 Bridges	$1,100 Plans $2	21,000
Westchester (Rte. 118)	FARC 58-97	Pines Bridge Yorktown Heights, S.H. 148 Yorktown Heights Putnam County Line, S.H. 149 Project DS 150(2)	0.94	9" Cem. Conc. Pavt. 24' Wide = 0.92 Mi. Misc. Work = 0.02 Mi.	$17,000 Plans $2	299,000
Westchester (Rtes. 9, 22, 120)	RC 58-100	Various State Highways on Route 9 (Yonkers to Croton River Bridge) Route 22 (Mount Vernon to Putnam County Line) and Route 120 (Purchase St. to Lake St.)	....	Roadside Development	$1,100 Plans $2	20,000
DISTRICT No. 9, JOSEPH C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 7)	FARC 58-102	Tunnel, S.H. 266 Sanitaria Springs Harpursville, S.H. 5243 Project DF 496(12)	5.32	Asphalt Concrete	$55,000 Plans $3	1,205,000
Sullivan (Rte. 17)	FARC 58-104	Monticello Liberty Pt. 1, S.H. 5035 Monticello Liberty Pt. 2, S.H. 5322 Liberty County Line Pt. 1, S.H. 5223 Liberty Village, S.H. 5296 Project F 495(12), F 336(19)	8.11 (8.97 Sh.)	Bit. Mat. Treated Shoulders = 8.97 Mi. 9" Cem. Conc. Pavt. 2 @ 24' Var. Wide = 8.05 Mi. Misc. Work = 0.06 Mi. 2 Brs. Reinf. Conc. Boxes 32' & 26.5' 1 Br. Twin Corrug. Pl. Pipe Arch 23' 6 Hy. Segs. Comp. W.F. Beams 201.8', 130.5', 285'; 232', 222' & 58.1'	$550,000 Full Size Plans $100	9,910,000
DISTRICT No. 10, M. E. GOTT, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx	FICBE 58-4	Interstate Route Conn. No. 511 Cross Bronx Expressway (Cont. 5) (Walton Ave. to Clay Ave.) Project I 1084(32)	0.60	9" Cem. Conc. Pavt. With Carb. Black, Var. Wide = 0.47 Mi. Misc. Work = 0.13 Mi. (Access Rd. Pavt. = 10,300 S.Y. Sheet Asph. 4,800 S.Y. Cem. Conc. Pavt. & 400 S.Y. Granite Block Pavt.) 5 Hy. Segs. Steel Rigid Frames 122', 88.7', 100.7', 101' & 123.8' 1 Girder & Column Underpass 87' x 303.2' Long	$650,000 Plans $20	11,788,000
Kings	FIGE 58-1	Interstate Route Conn. No. 512 Gowanus Expressway, Cont. 1 (3rd Ave. 39th St. to 60th St.) Project I 1066(23)	1.05	Demolition of Buildings	$50,000 Plans $2	913,000
New York	FAHRD 58-2	Harlem River Drive (Cont. 141B: E. 133rd St. to E. 135th St.) Project DU 1133(1)	0.08	Reinf. Conc. Bulkhead Wall	$21,000 Full Size Plans $10	382,000
Suffolk (Rte. 25)	FARC 58-93	Port Jefferson Riverhead, Pt. 3, S.H. 8066 Project DF 83(10)	3.31	Asphalt Concrete	$19,000 Plans $2	350,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: October 25, 1958

Government of Iraq Development Board & Ministry of Development Construction of Batmah Barrage Contract No. (1)

The Development Board and Ministry of Development invites Contractors experienced in such work to Tender for construction of the Batmah Barrage. The Batmah Barrage is located about 36 kilometers from Altum Kupri, in the Kirkuk vicinity, on the Lesser Zab River.

The work consists of the construction of the main barrage, retention dam and the Adhaim Feeder Regulator.

The Batmah Barrage is a concrete overflow structure upon which will be constructed 17 piers which will contain 17 radial gates, 6 meters high by 10 meters width, with provisions being made for a fish pass, divide wall and sluice gates. On the right bank of the river will be constructed a combination earth, sand and gravel fill retention dam approximately 12.5 meters in height which will contain a concrete core wall throughout its length. The Adhaim Feeder Regulator, also a reinforced concrete structure, will contain 5 radial gates, 2.5 meters high by 6 meters width, which connects with the main barrage at the left retaining wall. A 10 meter highway bridge will be constructed over the main barrage and regulator. Major quantities of work involved are as follows:—

Unclassified
Excavation .....210,000 Cubic meters.
Fill .....310,000 Cubic meters.
Concrete ..... 55,000 Cubic meters.
Reinforcement
Steel ..... 1,400 Tons.

Tenders will be accepted for construction of the complete unit, and no bids will be received for only limited portions of the work. One copy of the Tender documents, together with one copy of the drawings and specifications, may be obtained on payment of ID. 10/—or the equivalent (which is not refundable) on or after 25th June 1958 from the following offices:—

a. Director General of Legal Affairs and Contracts, Ministry of Development, South Gate, Baghdad, Iraq.
b. Office of the Consulting Engineers, Binne, Deacon & Gourley, Artillery House, Artillery Row, London, S.W.1.
c. Iraqi Embassy, 2135 Wyoming Avenue N.W., Washington 8 D.C., U.S.A.
d. Lebanese Legation, Berne, Switzerland.

Copies of the documents for Tender may be inspected on or after 25th June 1958 at the following addresses:—

a. Office of the Development Board, Baghdad, Iraq.
b. Iraqi Embassies at Bonn, Germany; and Washington, D.C., U.S.A.
c. Royal Iraq Legations at Brussels, Belgium; Rome, Italy, and Vienna, Austria.
d. Swiss Embassy, Paris, France.
e. Lebanese Legation, Berne, Switzerland.
f. Office of the Consulting Engineers, Binnie, Deacon & Gourley, Artillery House, Artillery Row, London, S.W.1.

Tenders must be accompanied by cash deposit amounting to 5% of the tender price or a Bank's guarantee from any approved bank in Iraq. Enclosed in a separate enevlope a letter of capacity, method of procedure and articles of association must be submitted at the same time.

Tenders must be submitted to the Directorate General of Legal Affairs and Contracts in the Ministry of Development in sealed envelopes endorsed clearly on the outside with the words: "TENDER FOR THE BATMAH BARRAGE CONTRACT No. 1" and will be received up to noon Saturday October 25th 1958.

Tenders not submitted within the time specified or not accompanied by a receipt of the deposit or a letter of guarantee shall be neglected.

Tenders will only be accepted from firms who have had previous experience in works of similar nature and magnitude.

The Board does not bind itself to accept the lowest or any other tender.

Minister of Development.

Bids: August 5, 1958

Contract GT-140.002

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY GRAIN TERMINAL
MODIFICATION OF MOORING FACILITIES

Sealed proposals for the modification of mooring facilities at the Port Authority Grain Terminal at Gowanus Bay, Brooklyn, New York, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 5, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, July 24, 1958

Bids: August 12, 1958.

Project U-26-1 (7) North Expressway State Road No. 26 (Villamil Street to Intersection No. 5 Section) Municipality of San Juan, Puerto Rico

COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF HIGHWAYS
ADVERTISEMENT
July 6, 1958

The Board of Awards of the Department of Public Works of Puerto Rico, 1507 Ponce de León Avenue, Santurce, Puerto Rico, will receive sealed proposals for the construction of Project U-26-1 (7) NORTH EXPRESSWAY State Road No. 26, Municipality of San Juan, Puerto Rico.

Bidders shall submit their proposals at the office of the Board of Awards, 1507 Ponce de León Avenue, Santurce, Puerto Rico, until 2:00 P. M. (Puerto Rico time) on August 12, 1958, at which time and place said proposals will be publicly opened and read aloud.

The work to be performed is divided into two (2) parts.

Part I—Dry or Hydraulic Fill. Construction of an embankment with dry or hydraulic fill 0.695 Miles long and drainage structures.

Principal items for the dry fill are 134,725 cubic meters excavation of unsuitable material, and 328,970 cubic meters dry fill of which 128,000 CuM will be extra compacted.

Principal items for the hydraulic fill (Alternate for Dry Fill) are 387,900 cubic meters excavation of unsuitable material and 368,290 cubic meters of hydraulic fill.

Part II—Grading and drainage, approximate length 0.366 miles. Paving, 1.061 miles, of four lane divided expressway with frontage roads, including also the construction of an 18,00M reinforced concrete wharf, a 31.00M continuous reinforced concrete overpass and highway lighting.

Plans, specifications, instructions to bidders, and all necessary information may be obtained from the office of the Procurement and Contract Division, Department of Public Works, 1507 Ponce de León Avenue, Santurce, Puerto Rico, upon a deposit of EIGHTY ($80.00) DOLLARS in cash, money order or certified check payable to the Secretary of the Treasury of Puerto Rico until 96 hours prior to the opening of bids. The full amount of the deposit will be refunded to each depositor upon the return of the plans in good condition within twenty (20) days after the opening of bids.

Each proposal must be accompanied by a provisional bond in the amount set forth below in any of the forms indicated in the General Conditions.

Part I—Fifty thousand ($50,000.00) Dollars

Part II—Forty thousand ($40,000.00) Dollars

The Board of Awards reserves the right to accept any bid or to reject any or all bids and to award contract under the conditions found most favorable to the Commonwealth of Puerto Rico.

Roberto Sánchez Vilella
Secretary of Public Works

Bids: August 7, 1958

Contract M 58-9 for Cleaning and Painting Bridge E-2, Fourth St. Bridge in Waterford, Saratoga County, N. Y.

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D. S. T. on August 7, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, New York for:

Engineer's Estimate for M 58-9 is $5,700.00. Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 58-9 may be examined and obtained at the office of Mr. G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York.

The deposit for Plans and Proposal Forms for Contract M 58-9 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 58-9 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $300.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: August 7, 1958.

Contract M 58-12 for Cleaning and Painting Six Canal Bridges in Niagara County, N. Y.

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T. on August 7, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Engineer's Estimate for M 58-12 is $18,000.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 58-12 may be examined and obtained at the office of Mr. E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo 2, New York.

The deposit for Plans and Proposal Forms for Contract M 58-12 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 58-12 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: August 7, 1958

Project F-2-4 (6) Aguadilla By Pass Municipality of Aguadilla, P. R.

COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF HIGHWAYS
ADVERTISEMENT
July 6, 1958

The Board of Awards of the Department of Public Works of Puerto Rico, 1507 Ponce de León Avenue, Santurce, Puerto Rico, will receive sealed proposals for the construction of 6.027 Kms. of Project F-2-4 (6) AGUADILLA BY PASS State Road No. 2, Municipality of Aguadilla, Puerto Rico.

Bidders shall submit their proposals at the office of the Board of Awards, 1507 Ponce de León Avenue, Santurce, Puerto Rico until 2:00 P. M. (Puerto Rico time) on August 7, 1958 at which time and place said proposals will be publicly opened and read aloud.

Principal items are 872,800 CuM unclassified excavation; 172,800 CuM selected borrow material; 35,100 CuM caliche base course; 65,000 SqM concrete pavement and 7,900 Tons dense graded hot plant mix, Class F, Type F-1, and two continuous reinforced concrete overpasses, over all length 0.050 miles.

Plans, specifications, instructions to bidders, and all necessary information may be obtained from the office of the Procurement and Contract Division, Department of Public Works, 1507 Ponce de Leon Avenue, Santurce, Puerto Rico upon a deposit of ONE HUNDRED ($100.00) DOLLARS in cash, money order or certified check payable to the Secretary of the Treasury of Puerto Rico until 96 hours prior to the opening of bids. The full amount of the deposit will be refunded to each depositor upon the return of the plans in good condition within (20) days after the opening of the bids.

Each proposal must be accompanied by a provisional bond in the amount of ONE HUNDRED FIFTY THOUSANDS ($150,000.00) DOLLARS in any of the terms indicated in the General Conditions.

The Board of Awards reserves the right to accept or reject any or all bids and to award contract under the conditions found most favorable to the Commonwealth of Puerto Rico.

Roberto Sanchez Vilella
Secretary of Public Works

Bids: August 7, 1958

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of AUGUST 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name
DISTRICT No. 8, K. G. RAPER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York		
Orange (Rte. 32)	FARC 58-55	Vails Gate Newburgh City Line, S.H. 9033 Proj. DF 532(12)

Miles	Type	Deposit	Estimated Cost of Work
2.99	9" Cem. Conc. Pavt. 24' Wide	$15,000 Plans $3	$830,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wages) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: October 1, 1958

Government of Iraq Development Board and Ministry of Development Architect's Section Contract No. H. 1. (1958) Phase I Royal Medical City, Baghdad

The Development Board and Ministry of Development invite tenders from Building and Civil Engineering Contractors to act as a General Contractor for the erection and completion of Phase I of the New Royal Medical City, Baghdad.

The work comprises Piled foundations, concrete frame, brick infilling panels, and all finishings and services for the main Teaching Hospital and Service Building (Approximately 950 Beds).

The tender documents and drawings may be inspected at the following offices:

1. Directorate General of Technical Section 2, Iraq Development Board, Baghdad, Iraq.
2. Iraqi Embassy, 2135 Wyoming Avenue, N.W. Washington 8 D.C., U.S.A.
3. Iraqi Embassy, Am Hofgasten 1-2, Bonn, West Germany.
4. Royal Iraqi Legation, Largo Antonio Sarti 4, Rome, Italy.
5. Iraqi Embassy, 22, Queen's Gate, London, S.W.1. England.
6. Royal Iraqi Legation, 176, Avenue Bragmann, Bruxelles, Belgique.
7. Litchfield Whiting Panero Severud, and Associates, 292 Madison Avenue, New York 17, N.Y., U.S.A.
8. Litchfield Whiting Panero Severud, and Associates, Via IV Fontane 15, Rome, Italy.

Tender Documents, in duplicate, and typical plans only may be obtained on or after the 15 May 1958 from the Directorate General of Legal Affairs & Contracts, Ministry of Development, Baghdad, or from the Embassies, Legations and offices, listed above, on the payment of Iraqi Dinars Seventy 70 or the equivalent in local currency, which sum is not returnable.

Tenders will only be accepted from firms who have previously successfully carried out large building contracts of a similar nature.

Tenders must be accompanied by a preliminary deposit of ID. 20,000 (Iraqi Dinars Twenty Thousand) which shall be paid in cash or covered by a letter of guarantee from an approved Bank in Iraq, as described in the "Instructions to Persons Tendering".

Tenders must be submitted to the Ministry of Development (Directorate General of Legal Affairs & Contracts) in sealed envelopes marked "TENDER FOR ROYAL MEDICAL CITY" on or before 12 noon local time on the 1st October 1958, together with a letter of capacity, method of procedure and articles of association enclosed in a separate envelope.

Tenders not submitted upon the official Contract Documents within the time specified or not complying with the "Instructions to Persons Tendering" contained in the documents, will be neglected.

The Development Board does not bind itself to accept the lowest or any tender.

Minister of Development.

Bids: July 31, 1958

Soil Explorations and Foundation Investigations

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time on July 31, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON F.A.I. ROUTE 550, ROUTE CONNECTION NO. 4, SCHENECTADY SPUR, GENERAL ELECTRIC INTERCHANGE, CITY OF SCHENECTADY, SCHENECTADY COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-128.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. G. L. Nickerson, District Engineer, New York State Department of Public Works, 353 Broadway, Albany 1, N. Y.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $19,137.50.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

Bids: August 14, 1958

New Jersey Turnpike Authority

ADVERTISEMENT FOR PROPOSALS
CONTRACT NO. R-16

Proposals are invited for Contract No. R-16 which involves the construction of well houses, water treatment plants, sludge heating and storage buildings, together with other improvements to the existing water and sewage facilities and other incidental work at eight Service Areas and one Maintenance Area along the New Jersey Turnpike in counties Middlesex, Mercer, Burlington, Camden and Salem.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 o'clock Daylight Saving Time, on the morning of August 14, 1958, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement on the form furnished by the Authority.

Contract documents may be examined during office hours on or after July 16, 1958, at the office of the Authority and at the office of the Consulting Engineers, Elson T. Killam Associates, Inc., 48 Essex Street, Millburn, New Jersey. Contract documents will be furnished upon payment of ten dollars ($10.00) for each set, upon application to the Authority.

Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman
July 11, 1958

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.
July 31st issue closes July 24th

DISPLAYED RATE:
The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.
An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.
Subject to Agency Commission.

UNDISPLAYED RATE:
$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Highway Engineers—Highway Engineers with a minimum of 3 years experience. Excellent opportunity with established consulting engineering firm in Middle West. P-7909, Engineering News-Record.

Have opening for several recent Civil Engineer Graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, use no intoxicants, preferably single, willing to start in the field on industrial buildings and heavy construction, and willing to move. We operate throughout Kansas and adjacent states. Our organization offers excellent opportunity for advancement. We pay top wages. Martin K. Eby Constr. Co., Inc., P.O. Box 1679, Wichita, Kansas.

Hydraulic Engineers—Civil Engineer Graduates— All grades, experienced in hydraulic design of channels and bridges and/or design and construction of dams, for regulatory agency. Duties include review of plans and specifications, report writing, field investigations and inspections, with some travel and public relations. Salary depending on experience. Location—Harrisburg, Pennsylvania. P-8403 Engineering News-Record.

Wanted: Experienced concrete paving superintendent for contractor working predominantly in the Texas area. P-8395, Engineering News-Record.

County Engineer Wanted: Require registered engineer with highway experience. For more information contact Guthrie County Board of Supervisors, Guthrie Center, Iowa.

Manager for pre-stressed concrete producer. To take complete responsibility for sales, production, and engineering. Fine opportunity in new industry for man with leadership and resourcefulness. Qualifications: graduate engineer; age 28-40; construction industry experience; preferably some concrete design. Location: Middle West—Salary: open. *Send complete resume. P-8424, Engineering News-Record.

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Director of Public Works/City Engineer—Petaluma, Calif. (pop. 13,500). Calif. registration and three years municipal experience desirable. Salary range $641-$788. Apply City Manager, Room 2, City Hall, Petaluma, Calif.

Superintendent, Deep Sewer Work, Mid-Ohio Location. Furnish complete qualifications and experience. P-8480, Engineering News-Record.

Wanted Soil Technician with experience in foundation test drilling and visual soil classification. Drafting laboratory experience and some college training desirable. Contact immediately, American Test and Engineering Corporation, 5204 East 25th Street, Indianapolis, Indiana. Phone Liberty 7-9618.

Office Engineer—Heavy Construction background —must know excavation, concrete reinforcement, subcontracts and formwork, also concrete and structural design in connection with construction plant. Give full details covering education, experience, references, salary and personal data. Apply P. O. Box 296, Niagara Falls, New York.

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Registered highway engineer, land surveyor, 30 years experience. Engineer or construction superintendent, highways, bridges, sewers. PW-8429, Engineering News-Record.

Construction Executive 30 years experience in all phases of heavy and industrial construction, power plants, chemical plants, sewage plants, filtration plants, refinery installations, locks, dams, and tunnels. Interested in connection with aggressive contracting company doing competitive bidding and promotional sales work. Estimating and pricing accurate and construction methods current. Desirous of participating arrangement. PW-8423, Engineering News-Record.

Structural Engineer: BCE, PE: 26, single, Experience; 2 years Asst. IEO, USAF, 1 year instructor in accredited college, 2 years structural design, principally bridges. PW-8430, Engineering News-Record.

Supt. Const. 20 yrs. Institutional, Industrial, Commercial. Engineer. Anywhere. PW-8457, Engineering News-Record.

Civil-Sanitary Engineer. B.S.C.E., MSCE, Reg. P.E., 4 years as Resident Engineer & Superintendent on water works construction. 2 years administration and preliminary design. Seek position with firm in above or related fields. Any location considered. PW-8420, Engineering News-Record.

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Registered Civil Engineer, 39, married. 20 years construction experience. Estimating, purchasing, structural design. Desires permanent position with chance to grow. Will relocate. PW-8483, Engineering News-Record.

Construction Superintendent of Foreman. 18 years experience highway construction supervising heavy earth moving equipment—excavating, grading, and drainage. Prefer Midwest or Far West. E. A. White, P. O. Box 358, Mt. Holly Springs, Pennsylvania.

Construction Superintendent—general construction, age 46, 12 yrs. last employer, hold Carpenter's book. PW-8465, Engineering News-Record.

Construction Engineer-Manager. Reg. Civil, A.M. ASCE, attorney, member State bar, 34. 11 yrs. engr'g design & construction admin. Resume on request. PW-8473, Engineering News-Record.

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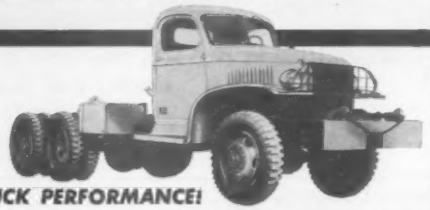

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A Tragedy

Of all Middle East countries, Iraq was the one where enlightened policies of economic development were most noticeable. The King and his perennial prime minister, Nuri-as Said, were solidly in favor of using the bulk of their country's oil revenues on construction projects to raise the standard of living of the impoverished masses. They encountered opposition and probably made mistakes, but progress had been notable.

One cannot say that the new regime, if it prevails, will scrap or sabotage the development plan, but "the exceptionally brutal and revolting character of the coup" that brought it to power, to quote Ambassador Lodge in the United Nations, is not encouraging. It compounds the tragedy that has threatened a reconstruction plan for an underdeveloped country, which had excited worldwide admiration and respect.

Changed Power Concept

Almost unnoticed because it is so logical and inevitable, the concept of firm power from hydro installations is receiving new acceptance as a basic requirement. Off-peak pumping is a partial manifestation of this trend, but another and more arresting one is the use of steam power plants to fill in the gaps when the water wheels cannot turn.

It can truly be said there is nothing new in this marriage of these two means of generating power, but it must also be admitted that acceptance of its necessity on a big scale marks, at least, a change. It is a change dictated by the almost insatiable demand for power to support our economy of growth, and it is a change that has important implications for engineers and engineering.

It was probably the action of the Tennessee Valley Authority in adopting a policy of big steam stations to supplement its series of hydro plants on the Tennessee and its tributaries that inaugurated the change—or at least highlighted it. Now, however, comes the prediction that the same practice must be followed on one of our greatest hydro streams, the Columbia, within two decades and maybe sooner.

Rather significantly, too, the prediction was made at the recent joint meeting in Glacier National Park of the Interagency Committees for the Columbia Basin and the Missouri Basin, where water use was the obvious topic. William A. Pearl, administrator of the Bonneville Power Administration, pointed to the Columbia's low flow in fall and winter as justification for steam plants to firm up the kilowatt output. And Col. Allen F. Clark, Jr., North Pacific division engineer of the Corps of Engineers, agreed that hydro must eventually be supplemented by steam in this rapidly developing industrial section of the country. Colonel Allen placed within 22 years the time when further large scale hydro electric developments in the Columbia system will become economically unfeasible.

The Columbia must be considered significant because of its relatively large discharge. On lesser, more variable streams, the need to supplement hydro with steam will be even more compelling.

Fortunately, in considering steam power, engineers will have few worries as to heat sources. Nuclear reactors promise an almost inexhaustible supply, and oil and coal are going to be available for many years to come. As a consequence, fuel economics will be one of the big engineering problems of the future. Another will be steam plant location, and a third will encompass design of the various plant elements. If a good deal of this seems to be mechanical, electrical and chemical engineering, rather than civil, that is also one of the implications for engineers to rationalize. It may very well be that the future will bring forth the "power engineer" as a separate specialist. That, indeed, is the big question raised by the changed power concept.

Cracks in the Picture Window

Airing grievances, a phrase and a pastime almost monopolized by labor unions in these modern times, found its place in the halls of management recently when bits and pieces of the program of the annual meeting of the American Institute of Architects turned out to be veritable gripe sessions. Altogether it was a healthy display of dissatisfaction, well worth fostering, and deserving of wide emulation.

The architects don't like a number of things. Some of these reprehensible activities, they carry on themselves. Others originate elsewhere. The criticism was impartial, and it covered considerable territory. It was perhaps best symbolized by Royal Barry Wills who, in summing up his criticism of the poor design used in many small residences, warned. "There's a crack in the picture window too big to be ignored."

Apparently there are cracks in a good many picture windows. For example, architects are fed up with senseless variations in building codes; too often, they are required to do something in one city that is prohibited in another. Also, architects don't like package builders, and they are put out by some mortgage lending practices, but by airing these grievances they stirred speakers to offer good advice on both subjects.

The point is that improvements and progress result from exposing faults and failures, not from hiding or ignoring them. In scheduling discussions of sore spots in their profession, the American Institute of Architects struck a blow for progress. It is a practice that many other parts of the construction industry could follow with profit.